

Circular 588
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PEANUT MONEY-MAKER

PRODUCTION GUIDE – 2008



Some Varieties are Less Disease Resistant than Others, Collar Rot, Edisto REC 07.



Variety Challenge and Digging Date Tests, Edisto REC 07.

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INTRODUCTION

THE KEYS TO HIGH QUALITY, TWO-TON PLUS PEANUTS ARE:

- 1) A WELL DRAINED SOIL
- 2) SUITABLE ROTATION CROPS – COTTON, CORN OR OTHER GRASSES
- 3) WATER DURING POD FILL
- 4) GOOD HARVEST WEATHER
- 5) TIMELY MANAGEMENT OPERATIONS.

Peanut is a relatively high-input, high management row crop. But profit is not determined by spending more money or adding one more product to the spray tank that “might help”. It’s about doing the fundamentals on time and getting the most out of every dollar invested.

This book is a guide for making timely peanut management decisions. The intention is to provide growers, county agents, private consultants, and industry representatives with a reference guide that will answer most questions about peanut production under South Carolina conditions.

Where possible information is summarized in table format (“Fertility Checklist”, “Guide to Peanut Fungicides”, etc.) to present topics briefly, but in sufficient detail. Summaries of the most important steps are also given in the “Top Ten List” and “Peanut Management Calendar” on the final pages of this guide.

PEANUT VARIETIES

There are four peanut market types: virginia, runner, valencia, and spanish types. Virginia types and runners (the two main types grown in S. C.) differ from valencias and spanish types in that neither the virginia or runner types bloom and produce fruit on the upright main stem. The difference between a virginia and a runner is based on pod size. If at least 40% of pods ride a 34/64 inch roller standard, then that variety technically has enough “fancy pods” to qualify as a virginia market type.

Within both the virginia and runner market categories there are many varieties available and new ones being released every year. Despite this abundance of released varieties only a relative few are best adapted for production under S. C. climate and disease conditions. See the following discussion and table for variety characteristics and performance results.

VIRGINIA TYPES

NC -V11: NC V11 is the current standard for virginia types under S. C. conditions. It has high yield and grade potential, a bright hull, relatively low susceptibility to late leaf spot, and some tolerance to tomato spotted wilt virus (TSWV). NC-V11 does not always have the highest yield under excellent moisture conditions, but tends to outperform other virginia types under drought stress. NC-V11 is a medium maturity Virginia type and typically matures in about 132 days at Blackville.

AT-VC2: This variety has outstanding yield and grade performance in S. C. trials, but AT-VC2 has slightly smaller pods for a virginia type and therefore sheller demand has been limited. TSWV resistance is similar to NC V11. AT-VC2 is a bit more susceptible to late leaf spot than NC-V11, but less susceptible than Gregory, Phillips, or Perry. AT-VC2 may also be slightly less susceptible to white mold based on our tests.

Va 98R: Va 98R has yielded well under S. C. conditions and can be slightly earlier in maturity than NC-V11. Va 98R is more susceptible to TSWV than is NC-V11 and therefore should not be planted early (before about 7 May). Leaf spot susceptibility is similar to NC-V11.

Gregory: Gregory has high yield potential, very large pods, and one of the highest ELK scores available. Although Gregory has resistance to spotted wilt, this variety is not immune and will be severely affected under heavy thrips pressure. This variety is very susceptible to late leaf spot. Gregory is particularly susceptible to drought stress and calcium deficiency because of its large pod size, and therefore does best under irrigation. The large pod size makes it most suitable for sandy-surfaced soils to avoid digging loss. Gregory also fits the green peanut market in S. C. because of its size and hull brightness.

Champs: Champs is a new, early-maturing variety that has performed well under S. C. conditions. It has shown high yield, slightly higher SMK and ELK than NC-V11, and virus resistance at least as good as NC-V11. Champs is more susceptible to leaf spot than NC-V11, but less susceptible than Perry, Phillips, or Gregory. **Right now Champs looks like the best new virginia-type candidate for on-farm testing against standards.**

Phillips: Phillips is a new medium maturity variety with high yield potential, large, bright pods and high ELK. Phillips is highly susceptible to late leaf spot, white mold, and TSWV. Phillips performs

well under irrigation with increased fungicide protection.

Florida Fancy: This is a new release with very limited seed supply. Florida Fancy is reported to have resistance to white mold and tomato spotted wilt. Maturity may be slightly later than NC-V11. In 2007 tests at Blackville, yield was competitive with NC-V11. Florida Fancy also has high oleic oil chemistry.

-----**Based on yield performance and buyer acceptance (pod size, seed size, brightness), virginia varieties listed above this line are considered most competitive in S. C.**-----

Perry: Perry is a later maturing, bright-hulled variety with CBR resistance. This variety has a larger pod and higher % ELK than NC-V11. Perry is highly susceptible to both TSWV and late leaf spot. In most S. C. tests, Perry has not yielded with the NC-V11 standard, but Perry is the variety of choice in fields known to have severe CBR problems.

Va 92R: This is a consistently high-yielding virginia type under S. C. conditions. Va 92R has more ELKs than NC-V11, but a slightly darker hull has limited demand for the in-shell market. Va 92R is susceptible to TSWV.

Georgia HI-O/L: This variety has a high oleic to linoleic fatty acid ratio which improves shelf life. Yield has been competitive with NC-V11. TSWV resistance is similar to NC-V11. Ga Hi-O/L is susceptible to late leaf spot. Demand has been limited in the virginia market due to pod size and shape.

Georgia 05E: Although Georgia 05E qualifies as a virginia-type, the pods are not as long as traditional virginia types which limits acceptance for in-shell use. Georgia 05E has later maturity than standard virginia types and therefore should be planted by 10 May. Georgia 05E has high yield; excellent grade (SMK); and resistance to spotted wilt, late leaf spot, and white mold.

Wilson: Wilson is an early-maturing variety with a very bright hull. It has about the same ELK as NC-V11, but SMK has been consistently less than other virginia types. Wilson is considered TSWV susceptible. Wilson also appears to be highly susceptible to white mold and CBR.

Brantley: Brantley has a very large pod (even slightly larger than Gregory) and high ELK scores. It does not recover well from drought stress, and is susceptible to spotted wilt virus, late leaf spot, and white mold. Brantley is a high oleic peanut.

NC 7: NC 7 has large pods and a high ELK percentage. This variety is susceptible to late leaf spot, spotted wilt virus, and is highly susceptible to Diplodia collar rot. Yield is generally not competitive with Gregory, and therefore NC 7 is not the best choice among large-podded varieties.

NC 12C: NC 12C is a large peanut with CBR resistance. However, Perry should have greater yield potential in CBR problem fields.

RUNNER TYPES

Georgia Green: This variety is the current runner standard due to its long history of outstanding yield and grade performance over a wide variety of soil moisture conditions. Ga. Green has medium runner maturity (about 140 days). Ga. Green yield performance has been more erratic over the past 3 to 4 years, perhaps due to increasing susceptibility to spotted wilt virus. It has done best in low virus years.

Georgia 03L: Georgia 03L is a medium maturity runner with large, bright pods. Ga. 03L has good resistance to TSWV, late leaf spot, and white mold; as well as some CBR resistance. **Georgia 03L is a good virus-resistant alternative to Ga. Green until the seed supply of other new runners improves in 2009.** Georgia 03L tends to out-yield Georgia Green under high virus pressure. Grade performance (TSMK) is about 1.5 points below Ga. Green.

Georgia Greener: Georgia Greener is a new release with very limited seed supply in 2008. It is medium maturity with pod size similar to Ga. Green. This variety has shown excellent yield potential, high SMK, and exceptional disease resistance thus far in S. C. trials. **A good one to try if you can get any seed.**

Georgia 06G: This is another new release with very limited seed supply. Ga. 06G is a medium maturity runner with large pods. This variety has also shown excellent yield potential, high SMK, and disease resistance in S. C. trials. **Try this one if you can get it.**

Georgia 02C: This 2002 release has high yield and greater resistance to CBR and TSWV than Ga. Green. Maturity is about 10 days later than Georgia Green which limits use in S. C. due to the need for early planting (no later than 10 May). Pod and seed size are slightly larger than Ga. Green. This is a high oleic peanut.

Florida 07: Another new release with limited seed availability. Florida 07 matures about 5 days later than Ga. Green, has high yield potential, and excellent leaf spot resistance. This is a large seeded, high oleic runner. **Try some if you can get seed.**

McCloud: McCloud is a new mid-maturity runner with spotted wilt virus resistance. Based on one year's test, it was yield competitive with the Ga. Green standard. This is another high oleic runner.

AT-215: AT-215 is a new release to replace ViruGard. AT-215 has maturity, pod size, and seed size similar to ViruGard, but a higher oleic oil profile. In 2007 tests, AT-215 demonstrated higher yield than ViruGard, but greater leaf spot susceptibility compared to other runners.

AP-3: This is a relatively new release with medium maturity and resistance to TSWV and white mold. AP-3 did not yield as well on-farm as Ga. Green or Georgia 03L under drought stress. AP-3 is highly susceptible to CBR.

ViruGard: ViruGard is probably the best early-maturity runner (~125 day) available. This variety has some TSWV resistance but is relatively susceptible to late leaf spot for a runner type. Yields of ViruGard and other early-maturing runners generally are lower than medium maturing lines.

-----Runners above this line currently ranked as most competitive in S. C.-----

AT 3081R: This is a new medium maturity runner. Maturity and yield performance was similar to Ga. Green in 2006, but under high yield conditions in 2007, performance was below Ga. Green. AT 3081R has spotted wilt resistance but is susceptible to late leaf spot.

AT 3085: Under high-yield irrigated conditions in 2007, AT 3085 produced yield equivalent to the Ga. Green standard.

AgraTech 201: Similar to Ga. Green in maturity, has more vigorous growth and larger kernels, but less virus resistance.

AT 1-1: This is an early-maturing variety (about 125 days) that has been yield competitive with Ga. Green in S. C. AT 1-1 is reported to have some TSWV resistance.

Georgia 01-R: This runner variety has broad disease resistance including improved TSWV resistance as well as early and late leafspot, white mold, CBR, and leaf scorch. This is a late maturing variety and would need to be planted in early May. There have been some stand problems with 01R.

Carver: A medium maturity (140 day) runner variety with TSWV and white mold resistance. Carver has lower grades (SMK) than Ga. Green and is not considered to be yield competitive in most areas of the Southeast.

C99R: C99R has large pods and improved tomato spotted wilt resistance, but requires 150 days to mature and therefore must be planted during the first week of May. C99R has had inconsistent stands.

DP-1: This is a late-maturing (150+ days) variety. DP-1 has excellent resistance to TSWV, white mold and late leafspot. Georgia 01-R or Georgia 02-C would probably be better choices for a later maturing runner type under S. C. conditions.

Tifrunner: This is a late maturing runner that is vulnerable to leaf spot and white mold. At present does not look like a good fit for S. C. conditions.

Peanut Performance and Variety Characteristics

Virginias	Yield ¹ lb/ac						Grade ² %		Approximate Seed Size number/lb ³	Maturity days ⁴	High ⁵ Oleic	Disease Tolerance ⁶						
	2004	2005	2006	2007	SC Multi- Year Yield Index	# yrs. above std.	TSMK (2007)	ELK (2007)				TSWV	CBR	WM	RLR	ELS	LLS	WB
NC V11	3842	2791	2400	5342	--	--	73.3	42.9	625	135	no	R-	S	S	S	S	S	S+
Gregory	4234	3084	2134	5152	+ 62	5/9	73.2	54.4	475	135	no	R	S	S	S	S	S+	S
Perry	3572	--	2160	4894	(324)	0/7	75.4	51.7	525	140	no	S	R	S	S	S	S+	R
Wilson	4086	2831	2674	5142	+ 57	4/6	71.2	45.4	575	130	no	S	S	S	S	S	S	S
VA 98R	4221	--	1929	5309	(50)	3/8	73.7	47.9	575	132	no	S	S	S	S	S	S	S+
GA Hi-O/L	4497	4100	2746	--	+ 301	5/8	--	--	675	135	yes	R-	S	S	S	S	S-	--
VA 92R	--	--	--	--	+ 190	5/6	--	--	550	135	no	S	S	S	S	S	S	S
AT VC2	5004	4031	3056	5693	+ 588	7/8	73.5	45.8	600	135	yes	R-	S	R-	S	S	S	R
GA 05E	--	4326	2322	--	+ 728	1/2	--	--	650	145	yes	R	--	S	--	R	R	--
Phillips	--	3523	2134	5092	+ 72	1/3	75.7	57.4	570	135	no	S	S	S	S	S	S+	--
Champs	--	--	2844	5511	+ 306	2/2	75.0	54.8	525	130	no	R-	S	S	S	S	S	S
Brantley	--	--	1816	4800	(563)	0/2	75.1	55.2	475	135?	yes	S	S	S	S	S	S+	S
Florida Fancy	--	--	--	5063	(279)	0/1	71.9	46.6	?	135?	yes	R	S	R?	S	S	S	--
Runners																		
GA Green	3945	3248	2897	5081	--	--	75.3	--	800	140	no	R-	S	R-	S	S	S-	S
GA O2-C	4653	4016	2361	--	+ 179	3/5	--	--	750	150	yes	R	R	R-	S	S	S-	--
GA 01-R	5020	4047	2049	--	+ 56	2/4	--	--	690	150	no	R	R	R	S	R	R	--
GA 03-L	4965	4370	3125	4457	+ 440	3/4	74.0	--	650	140	no	R	R	R	S	S	R-	--
GA Greener	--	--	--	5699	+ 618	1/1	77.0	--	750?	140	no	R	--	R-	--	S	S-	--
GA 06G	--	--	--	5783	+ 702	1/1	78.6	--	650?	140	no	R	--	R-	--	S	S-	--
Florida 07	--	--	--	5471	+ 390	1/1	74.9	--	700?	145?	yes	R	--	R	--	S	S-	--
McCloud	--	--	--	5130	+ 49	1/1	75.8	--	?	140	yes	R	S	--	S	S	R-	--
Viruguard	--	3760	1957	4669	(220)	3/9	75.1	--	650	130	no	R-	S	S	S	S	S	--
AP-3	--	4028	2816	--	+ 349	1/2	--	--	700	140	no	R-	S+	R	S	S	S	--
AT 215	--	--	--	5261	+ 180	1/1	75.6	--	650?	130	yes	--	--	--	--	S	S	--
AT 3081R	--	--	2797	4229	(476)	0/2	73.3	--	650?	140	no	--	--	--	S	S	S	--
AT 3085	--	--	2579	5085	(156)	1/2	74.7	--	?	140	yes	--	--	--	--	S	S	--

¹ Yields are from Edisto REC variety trial. Multi-year yield index comparisons are plus or (minus) lbs/ac relative to the standard virginia-type (NC V11) or runner type (GA Green). Yrs above standard indicates the number of years that each variety had numerically higher yield than the standard out of the number of years tested.

² TSMK = total sound mature kernels; ELK = extra large kernels. Grades shown are 2007 results at Blackville.

³ Seed sizes are relative. Actual size will vary significantly by seed lot.

⁴ Maturity comparisons are only relative. Actual harvest date is dependent on growing season, plant health, and weather conditions. 135-day virginia-type and 140 day runner-type peanut are considered medium maturity. A 150-day runner is late for our growing area. ⁵ A high oleic to linoleic fatty acid ratio increases shelf life.

⁶ **Disease resistance is a relative scale and does not imply immunity.** R = resistant; S = susceptible. TSWV = tomato spotted wilt virus; CBR = *Cylindrocladium* black rot; WM = white mold; RLR = *Rhizoctonia* limb rot; ELS = early leaf spot; LLS = late leaf spot; WB = web blotch. TSWV ratings are based on Blackville, UGA, and NCSU data.

CROP ROTATION

Rotation into non-legumes (cotton, corn, or other grasses) is absolutely essential to sustainable, long-term peanut production. *Cylindrocladium blackrot* (CBR) is increasing in S. C. and rotation is the most important factor in suppressing this and other diseases. An absolute **minimum of 2 years (3 or 4 years better)** out of legumes is recommended for sustainable peanut production. **Soybeans should be avoided** in a peanut rotation due to increased CBR and white mold problems. **Tobacco** rotations also increase white mold pressure.

Volunteer peanuts must be controlled in the following crop to prevent losing a year's rotation. Peanuts are tough weeds and often require a two-step treatment program.

VOLUNTEER PEANUT CONTROL*

Corn					
PRE		POST / POST Directed			
Atrazine	G	Accent	F		
		Atrazine	F-G		
		Banvel, Clarity	F-G		
		Basis Gold	F-G		
		Beacon	F		
		Evik	G-E		
		Liberty**	F-G		
		Lorox, Linex	G		
		Simazine	F		
		Stinger	F-G		
		Glyphosate***	F-G		
Cotton					
PRE		POST-Directed		POST Over-Top	
Cotoran	P-F	Caparol + MSMA	F-G	Cotoran	F
		Cotoran + MSMA	F-G	Envoke	P-F
		Direx, Karmex + MSMA	F-G	Glyphosate***	F-G
		Envoke	F-G	Glyphosate*** +Staple	F-G
		Glyphosate***	F-G	Ignite**	G
		Glyphosate*** + Caparol or Direx, or Aim, or Envoke	F-G		
		Glyphosate*** + Harvade, or Staple, or Valor	F		
		Ignite**	G-E		
		Valor + MSMA	F-G		
		Suprend + MSMA	G		

* Modified from A. S. Culpepper, S. M. Brown, and E. P. Prostko. 2007. Georgia Pest Management Handbook

** Liberty or Ignite for use only on Liberty-Link varieties / hybrids.

*** Glyphosate for use only on glyphosate resistant hybrids or varieties.

TILLAGE

Peanuts can be produced successfully with many different tillage systems, but in any system, they do better on a slight bed. If subsoiled and bedded, knock the bed down so that at least a 16” wide flat bed is available (lower than typical cotton bed). If land is disked flat, throw up a bed with coulters on the planter. Bottom plowing is not recommended unless absolutely necessary to turn down potash (to reduce competition for Ca uptake in the pegging zone) or bury residue on non-rotated fields.

Strip-tillage has given equivalent yields on lighter soils and we have been able to control weeds without preplant incorporated (PPI) herbicides under irrigated strip-tillage conditions. Strip-tillage into a cover crop or other crop residue reduces tomato spotted wilt. Use coulters on the strip-till planter to establish a slight planting bed. Planting between the previous rows is recommended to minimize roots and stalks in the pegging zone. In general there are fewer worm problems in strip-till peanuts.

PLANTING

Planting Date: The best planting window for peanuts in S. C. is from about 5 – 25 May. Large acreages (300 and up) should be spread out over a 2-week planting interval to spread harvest maturity. Peanuts do well planted the first week of May, but try to avoid April planting to reduce tomato spotted wilt risk (see virus management below). Fields with high CBR risk should be planted last to maximize early season soil temperatures. We have enough growing season to finish planting during the first week of June if absolutely necessary, but **harvest conditions usually deteriorate rapidly after 1 Nov.** Lower temperatures and shorter days severely limit drying time and combining hours. See the discussion on cold injury.

Soil Temperature: Should be at least 65° F at 4” depth, but soil temperature is seldom a concern for May planting in S. C.

Seeding Rate and Plant Population: Our goal is to get a uniformly emerged stand of 4 plants per row ft. to help control tomato spotted wilt virus. A seeding rate of 6 per row foot is recommended for runners (at least 5 per ft. for virginia types due to greater seed cost).

Seed Quality: Low germ. peanut seed not only require higher rates to achieve adequate stands, but can also produce plants with reduced vigor and lower yield potential. CBR is seed-transmitted - know your seed source.

Seeding Depth: Plant into consistent moisture up to a

**Peanut Seeding Rates
(Lbs of Seed Per Acre)***

Seed size (seed/lb)	4 seed per row ft.	5 seed per row ft.	6 seed per row ft.
450	122	153	183
500	110	138	165
550	100	125	150
600	92	115	138
650	85	106	127
700	79	98	118
750	73	92	110
800	69	86	103
850	65	81	97
900	61	76	92

*Based on 38” rows. For 36” or 30” rows, multiply seed per ft by 0.95 or 0.789 respectively to get the seed spacing for the same seed population per acre. Conversely, to maintain the same seed population per row ft on 36” or 30” rows, you would have to multiply the poundage by 1.05 or 1.27 respectively.

maximum depth of 3 inches assuming good seed quality. Under good moisture conditions, 1.5” depth is ideal and there is no need to plant shallower unless the seed have very poor vigor. Planting shallower than 1.5” will increase the risk of Valor injury and also increase risk of inoculant failure in marginal soil moisture.

Row Spacing: Conventional row spacing is 36 - 38", but twin-rows (7” on 36-38” centers) help to reduce tomato spotted wilt virus by covering the ground more quickly. **Twin rows** can increase yield even in the absence of TSWV, but a GPS guidance system is recommended to allow digging of twin-row virginia types. On twin rows plant 3 seed per row ft.

FERTILITY

J. W. Chapin and J. J. Camberato

pH: The traditional recommended pH range for liming peanut land is 5.8 - 6.2. However given the critical need for Ca in virginia type peanuts we recommend a bias toward 6.2. A 6.4 pH increases the probability of Mn or B deficiency, but decreases potential Zn toxicity problems. Mn or B needs can be met with foliar application where needed.

N and Inoculants: Peanut is a legume and as such can get most of its N needs from nitrogen-fixing bacteria (*Bradyrhizobium*) colonizing the plant’s roots. To provide these needed bacteria you absolutely must inoculate all “new” peanut land, and should also inoculate land that has been out of peanut production for 3 years. **Use a liquid in-furrow inoculant.** In-furrow granular inoculants are less effective than liquids and usually stop-up in the delivery tube. Seed treatment inoculants have much lower bacterial counts and have not been as consistent as in-furrow liquids. Inoculants are living organisms; treat them with care. Make sure the inoculant is not out-of-date.

Inoculant Rules:

- Use only liquid in-furrow inoculants. Granulars & seed treatments are less reliable.
- Do not expose to heat.
- If inoculant sits in the tank overnight, treat it as water and add a fresh batch.
- Use a minimum of 5 gal water per acre; 8 gal probably better.
- Make sure the inoculant stream hits exactly in the center of the open furrow, not the dry furrow walls. Tips knocked out of alignment cause yellow peanuts.
- Don’t plant too shallow (less than 1.5”). Inoculant must hit moist soil or it will die.
- Do not use chlorinated water.
- Apply with a steady stream, not a pulsing pump.
- Twin rows require a full inoculant rate in each row (on new land).

Poorly inoculated fields usually will not show any yellowing until about 45 DAP. Inoculation can be checked by using a shovel to uproot plants. Simply pulling up plants will cause the lower taproot to break off and result in a low count. The presence of large (1/8” or larger) nodules on the taproot indicates successful inoculation. An average of 15 large nodules per taproot at 45 DAP is considered good; less than 10 per taproot is marginal and less than 5 indicates poor inoculation. If only small (1/16”) nodules are present and these are mostly on the lateral roots rather than on the taproot, the plant has probably only been colonized by native *Rhizobium* bacteria, not the applied inoculant.

Broadcast ammonium nitrate (375 lb/ac of 34% = 127 N units) or ammonium sulfate (600 lb/ac of 21% = 126 N units) can be used if the inoculant totally fails, but yield will probably not equal a properly inoculated crop.

SEE THE FOLLOWING FERTILITY CHECK LIST FOR COMPLETE FERTILITY GUIDELINES

P and K: Phosphorus and potash should be applied to the previous crop by soil test to the high level. Peanuts respond best to residual fertilizer, and typically no additional fertilizer is needed when the previous crop has been properly managed. Excess K in the pegging zone interferes with Ca uptake and causes pod rot, so avoid potash application in the spring whenever possible, particularly if you can't turn it under.

Calcium: Calcium is critical for pod development and high quality peanuts. Adequate Ca uptake increases peanut yield and grade by reducing pod rot (Pythium), and preventing unfilled pods or "pops". Calcium also reduces the risk of aflatoxin. In addition, calcium is important on seed peanuts to improve germination and seedling vigor.

Calcium can only enter the kernel by direct diffusion through the pod wall. It can not move downward into the pod through the peg phloem tissue. Also, no matter how high the soil Ca level, pods can not absorb Ca in a dry soil. Irrigation is a hedge against Ca deficiency because a moist soil keeps Ca available to the pods. If adequate calcium is not available in solution in the top 3 inches of soil when needed, we lose yield and grade. Virginia type peanuts require higher levels of soil calcium. The larger pod of a virginia type has a lower surface to volume ratio, so the calcium concentration surrounding the pod must be higher to compensate. Small runner type peanuts like Georgia Green usually do not respond to gypsum application when soil test calcium is over 600 lb/ac. In contrast, virginia types have often shown a significant yield response to gypsum even at soil calcium levels of 1,000 lb/ac. Large runner varieties such as Ga. 03L have an intermediate need for calcium compared to virginias and small runners.

The critical period for calcium absorption begins about 20 days after pegs first enter the soil and extends for at least 40 days after that. The first 10 days of this interval are particularly critical. Peanuts first peg at about 45 DAP, so before 60 DAP we want calcium already available in soil solution. **Better early than late with land plaster.**

Apply 300 lb/ac of Ca (**1500 lb land plaster**) at first bloom to all virginia types and all seed peanuts. Half this amount can be used if it is applied in a band over the pegging zone. Fall liming is beneficial in maintaining at least 600 lb Ca/ac and a 3:1 Ca to K ratio in the pegging zone. Ideally we would like to have an 800 lb Ca/ac soil test for virginia types if it can be obtained without driving pH over 6.4. On runner peanuts, use 200 lb/ac Ca (1000 lb land plaster) if soil Ca is less than 600 lb/ac, if Ca to K ratio is less than 3:1, or on runners for seed.

Boron: Boron is needed to prevent "hollow heart" - a condition where the internal surfaces of kernel halves are dark and sunken. Boron deficiency is more likely on deep sands with high pH. A soil test B level below 0.5 lb/ac (0.2 ppm) indicates a potential need for foliar boron. Apply 0.3 - 0.5 lb B/ac (1.5-2.5 lb/ac Solubor) in the first fungicide application or PPI/PRE herbicide application if compatible. **Excessive foliar boron is toxic to peanuts and application should never exceed a total of 0.5 lb B/ac.**

Manganese: Mn deficiency shows up as yellowing between leaf veins in the top of the plant. Mn deficiency is most prevalent on soils limed to 6.4 or higher. Prevent or correct with two foliar applications of 0.5 lb elemental manganese per acre (2-2.5 lb/ac manganese sulfate or Tecmangam,

or 1.5 lb/ac ManGro DF). Only foliar treatment is effective and new growth will remain deficient, so repeated applications of no more than the 0.5 lb elemental manganese rate are recommended.

Magnesium: Peanuts have a low soil test requirement for Mg, but keep an eye on soil test Mg levels following peanut production. Use of layer-house poultry litter or excessive Ca application to peanuts from land plaster can cause Mg to leach out of the rooting zone and lead to potential deficiencies on rotational crops (corn and cotton) which have much higher soil test Mg requirements. If Mg becomes deficient on soils with pH levels which are too high to lime, you get “boxed-in” because the only affordable way to supply Mg is in dolomitic lime. Peanuts only require a 20 lb/ac Mg soil test. But rotational crops require 60 lb/ac Mg with at least 10 % of cation exchange capacity being from Mg. At Mg levels of 120 lb/ac there is no 10 % CEC requirement. If the subsoil is within 15” of the surface, Mg leaching should not be a problem.

Zinc Toxicity: Peanuts are very sensitive to zinc. Stunted, dieing plants with split stems are a sign of zinc toxicity. Check zinc levels on any new land prior to planting, especially old peach orchards, pecan orchards, fields heavily treated with poultry litter or hog lagoon waste, or fields where zinc was repeatedly applied for high yield corn production. Zinc toxicity also occurs on old building sites or around stock pens which had galvanized roofs. Soil test zinc levels of 10 lb/ac can cause toxicity when the soil pH is below 6.0. Liming to increase soil pH can reduce zinc toxicity in contaminated soils. Also make sure the lime source is not contaminated with zinc in fields which already have marginal Zn levels. Fields with Zn levels of 6 - 10 lb/ac should be limed to at least 6.2 pH; fields with Zn levels of 11 to 20 lb/ac should be limed to at least 6.4; and fields with 20 - 30 lb Zn/ac should be limed to 6.5. Given the risk of loss on a high value crop, the difficulty of achieving uniform pH, and the non-uniform distribution of Zn in soils, the maximum Zn level in peanut fields should probably not exceed 30 lb/ac.

Tissue Testing can be useful for diagnosis of potential nutrient deficiencies. To get a representative sample, pick 20 recently mature tetrafoliate leaves from a suspected deficient area and compare to a similar sample from plants without the deficiency symptoms. Leaves should be pulled when dry and placed in a paper bag.

When diagnosing deficiency based on tissue testing always consider soil test evidence and field observations. For example, root stunting from very low pH or herbicide injury causes micronutrient deficiencies in leaves even when the nutrients are sufficient in the soil.

Peanut Tissue Test Sufficiency Levels:

N (%)	P (%)	K (%)	Ca (%)	Mg (%)	S (%)
3.50 - 4.50	0.20 - 0.50	1.70 - 3.00	0.50 - 2.00	0.30 - 0.80	0.20 - 0.35
Fe (ppm)	Mn (ppm)	Zn (ppm)	Cu (ppm)	B (ppm)	
50 - 250	20 - 350	20 - 60	5 - 20	20 - 60	

Nutrient Removal values are occasionally requested for share crop considerations, but N removal can be misleading since the N removed was fixed by peanut and there remains a net increase in soil N for the following crop after nut harvest.

Peanut Nutrient Removal Values (lb/ac):

	Weight removed	N	P2O5	K2O	Ca	Mg	S	Cl	B	Cu	Fe	Mn	Zn
nuts	4,000 lb	140	22	35	6	5	10	1	.04	.04	.30	.30	-
vines	5,000 lb	150	29	79	88	23	11	1	.02	.02	.20	.15	-

Poultry Litter: Poultry litter can be used on rotational crops but should not be used the year peanuts are planted. Peanuts do best when using residual fertility from litter previously applied to rotational crops.

Where poultry litter is used in peanut rotations, keep an eye on soil test Zn levels and the Ca to Mg ratio. Litter from layer houses can greatly increase soil Ca levels to the point of causing Mg leaching and Mg deficiency on rotational crops. Mg should be maintained at a minimum of 10 % of CEC (cation exchange capacity). The only affordable way to replenish soil test Mg after leaching is with dolomitic lime, however this option is not available without causing other deficiencies once soils are limed above about 6.4. In other words, very high soil Ca levels from litter are fine for peanuts, but can leave you with no remedy for Mg deficiency on corn or cotton.

PEANUT FERTILITY CHECK LIST

pH or Nutrient	Soil Test Sufficiency Level (Mehlich I)	Recommendations / Comments																		
pH	5.8 to 6.5	Liming to a pH value of 6.4 is useful in maximizing soil Ca levels and reducing Zn toxicity risk where necessary, but Mn deficiency is more likely at high pH levels (see below).																		
Nitrogen (N)	---	Use a liquid in-furrow inoculant on all fields that have been out of peanut production for 3 years.																		
Sulfur (S)	---	Sulfur has not been a limiting factor on peanut on coastal plain soils. Subsoil S and gypsum (CaSO ₄) applications can provide more than adequate S nutrition.																		
Phosphorus (P)	20 lb/ac	The soil test sufficiency level for both P and K on peanut is much lower than other crops because the peanut plant is very efficient at scavenging these nutrients from the soil. Add 40 lb P ₂ O ₅ /ac when soil test levels are medium (11-19 lb P/ac) and 80 lb P ₂ O ₅ /ac when soil test levels are low (<11 lb/ac). Peanut phosphorus requirements can always be met by maintaining adequate P levels on rotational crops.																		
Potassium (K)	60 lb/ac	At medium soil test levels (30-59 lb K/ac) add 40 lb K ₂ O/ac and at low soil test levels (<30 lb K/ac) add 80 lb K ₂ O/ac. When soil test K levels are in the 40-60 lb/ac range, a yield response to K application is likely only for high yield production (>4,000 lb /ac) on sandy soils (depth to clay >15") where subsoil reserves of K are less accessible. Maintaining adequate fertility on rotational crops should eliminate the need for K application to peanut. Excessive K levels can interfere with Ca uptake by pods (see Ca comments).																		
Calcium (Ca)	600 lb/ac and 3 : 1 Ca to K ratio (Always use gypsum on virginia types)	Runner type peanut yields seldom respond to gypsum application when soil test Ca is 600 lb/ac. However, virginia type peanuts have responded to gypsum even when Ca =1,000 lb/ac. Apply 1,500 lb gypsum (300 lb Ca) at bloom to all virginia type peanuts, all seed production peanuts, and to runners with < 400 lb/ac soil test or a Ca to K ratio < 3:1. Apply 1,000 lb/ac gypsum to runners with 400-600 lb/ac soil test. Maintain soil pH with dolomitic lime so both Ca and Mg will remain adequate.																		
Magnesium (Mg)	60 lb/ac and Mg at least 10 % of total CEC for rotational crops	Soil test Mg levels above 20 lb/ac are considered adequate for peanut. However, rotational crops will require Mg soil test levels > 60 lb/ac and Mg at least 10% of CEC. Use dolomitic limestone (contains about 200 lb Mg per ton) to maintain soil Mg levels.																		
Boron (B)	0.5 lb/ac	If soil test B is below 0.5 lb, apply foliar 0.3-0.5 lb B/ac (1.5-2.5 lb Solubor) as a foliar spray in the first fungicide application. Avoid toxicity from excessive B application.																		
Manganese (Mn)	<table border="1" style="display: inline-table; vertical-align: top;"> <thead> <tr> <th style="text-align: left;">pH</th> <th style="text-align: left;">Mn lb/ac</th> </tr> </thead> <tbody> <tr><td>5.8</td><td>6</td></tr> <tr><td>5.9</td><td>7</td></tr> <tr><td>6.0</td><td>8</td></tr> <tr><td>6.1</td><td>9</td></tr> <tr><td>6.2</td><td>10</td></tr> <tr><td>6.3</td><td>10.5</td></tr> <tr><td>6.4</td><td>11</td></tr> <tr><td>6.5</td><td>12</td></tr> </tbody> </table>	pH	Mn lb/ac	5.8	6	5.9	7	6.0	8	6.1	9	6.2	10	6.3	10.5	6.4	11	6.5	12	If soil test Mn is below the sufficiency value at the current pH or the target pH when lime is to be applied, apply 0.5 lb Mn (2-2.5 lb manganese sulfate or Tecmangam, or 1.5 lb ManGro DF) with both the 60 and 75 DAP fungicide applications. For pH values above those shown, the Mn sufficiency soil test value is 1 lb higher for each additional 0.1 of a pH unit.
pH	Mn lb/ac																			
5.8	6																			
5.9	7																			
6.0	8																			
6.1	9																			
6.2	10																			
6.3	10.5																			
6.4	11																			
6.5	12																			
Zinc (Zn)	Toxicity: See comments Deficiency: 1.6 lb/ac	<table border="1" style="display: inline-table; vertical-align: top;"> <thead> <tr> <th style="text-align: left;">Zn lb/ac</th> <th style="text-align: left;">Lime to pH:</th> </tr> </thead> <tbody> <tr><td>6 - 10</td><td>6.2</td></tr> <tr><td>11 - 20</td><td>6.4</td></tr> <tr><td>21 - 30</td><td>6.5</td></tr> <tr><td>> 30</td><td>no peanuts</td></tr> </tbody> </table> Soil test Zn levels of 10 lb/ac can cause <u>toxicity</u> when the soil pH is below 6.0. To prevent Zn toxicity, lime to the pH targets listed. Given the risk of loss, the difficulty of achieving uniform pH, and the non-uniform distribution of Zn in soils; fields with Zn levels over 30 lb/ac should probably not be planted in peanuts. Zn <u>deficiency</u> is more likely at high pH, high soil Ca, and high soil P levels. A Zn soil test level of 1.6 lb should be adequate even under these conditions.	Zn lb/ac	Lime to pH:	6 - 10	6.2	11 - 20	6.4	21 - 30	6.5	> 30	no peanuts								
Zn lb/ac	Lime to pH:																			
6 - 10	6.2																			
11 - 20	6.4																			
21 - 30	6.5																			
> 30	no peanuts																			
Copper (Cu), Chlorine (Cl), Iron (Fe), Molybdenum (Mo)		There is no evidence for deficiency of these micronutrients in coastal plain peanut production.																		

Jay W. Chapin and James J. Camberato, 3-04

GROWTH AND DEVELOPMENT

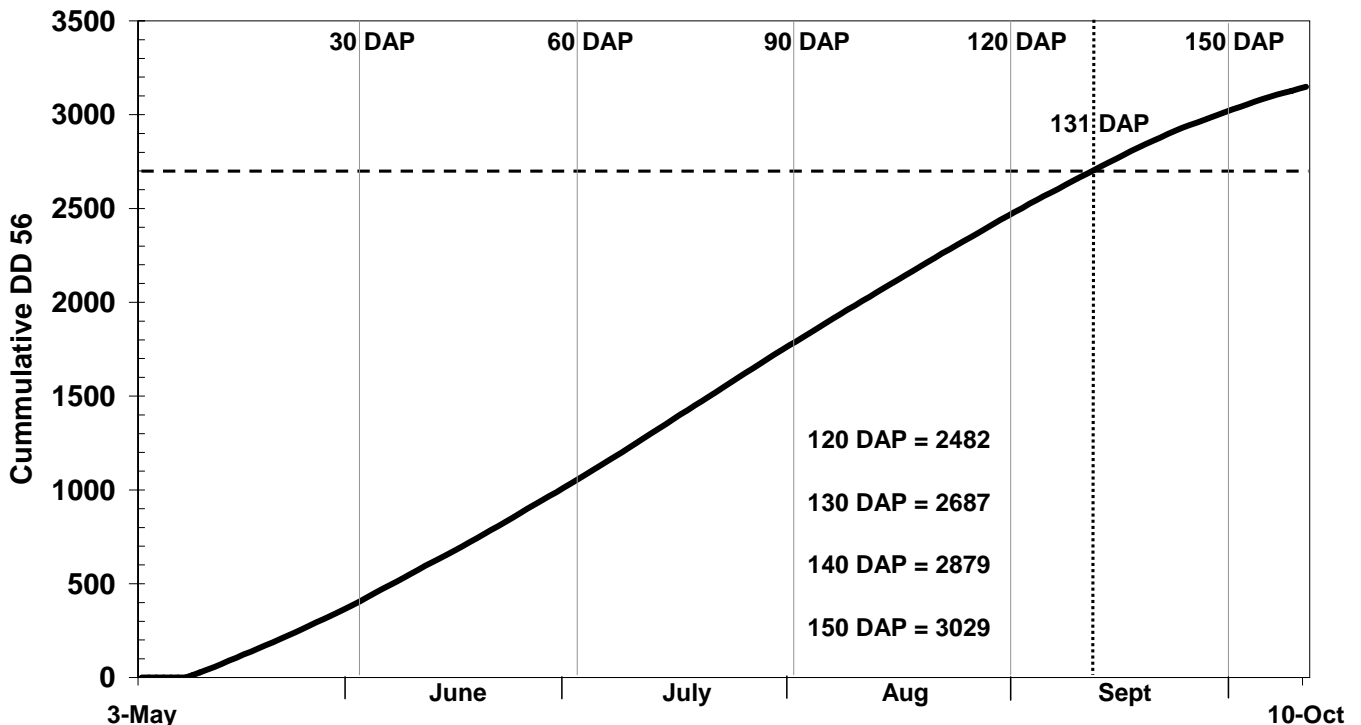
Peanut growth and development is temperature dependent, with 86° F being about optimal. High temperatures (over 95° F) slow plant growth and there is little growth below 60° F. Drought stress reduces flower production and pollination, and extreme soil surface temperatures cause peg abortion.

Peanut is an indeterminate plant capable of recovering from drought stress even during the reproductive period to rebloom and produce another crop of pegs. However optimal yields are produced when drought stress is avoided and extreme temperatures are minimized during the critical 60 – 100 DAP interval.

Temperature requirements can be thought of in degree days where the base developmental temperature (56° F) is subtracted from the average daily temperature and summed over a period of time. As an example, a medium maturity virginia type peanut such as NC-V11 requires about 2700 degree days (DD) after emergence.

Based on the 20-year temperature average shown below for Blackville SC, it takes about 124 days to accumulate 2700 DD if the crop emerges on 10 May. So adding 7 days for emergence, **under optimal moisture conditions it takes 131 DAP to mature the NC-V11 variety at Blackville if we plant on 3 May**. Many factors influence harvest maturity. Never dig based solely on days after planting. **See the harvest maturity section to determine when to dig.**

Peanut Degree-Day Accumulation 20-year average Blackville, SC



PEANUT GROWTH STAGES

Approx. Days After Planting*	Growth Stage	Description
7	Emergence	Seedling “cracking” the ground and cotyledons visible
35	Bloom (R1)	One-half of the plants with a bloom
45	Peg (R2)	Half of the plants with a visible peg
50	Swollen Peg (R3)	Half of the plants with a peg tip swollen to twice the peg diameter
60	Full Size Pod / Begin pod-fill (R4-R5)	Half of the plants with a full size pod (R4) and a visible seed beginning to form (R5).
75	Full Size Seed (R6)	Half of the plants with a seed filling the pod cavity.
100	Early Maturity (R7)	Half of the plants with a pod having interior hull color and orange to brown mesocarp.
130-140	Harvest Maturity (R8)	70 % of harvestable pods have an orange, brown, or black mesocarp (scrape pod saddle with knife) and interior hull color (crack pod open).
150	Over-mature (R9)	Kernels in oldest pods develop tan-brown seed coat and pegs may have deteriorated; over-mature pods have coal-black mesocarp color.

* Based on adequate soil moisture and average temperature conditions for a mid-maturity (130-140 day) variety.

Peanut Management Calendar: For a brief step-by-step management timing outline based on days after planting and growth stage see the Peanut Management Calendar on page 51.

Growth Regulator: If vine growth control is needed for digging, Apogee (7.25 oz/ac) can be applied when 50 % of the laterals touch in the row middle. A second application is made at 100 % row closure. Treating “marker rows” such as the middle two of a 6-row digger pass is more cost-effective than broadcast treatment.

Effective uptake of Apogee requires addition of nitrogen to the spray solution. Use 1 pt urea / ammonium nitrate (UAN) or 1 lb ammonium sulfate (AMS) per treated acre. One quart crop oil concentrate per treated acre is also recommended.

IRRIGATION

Irrigation is critical in peanut production because it allows you to take advantage of other inputs. Water is needed to move Ca from land plaster into the pegging zone and to keep soil Ca in solution and available to the pods.

Irrigation also improves the effectiveness of herbicides (e.g. Prowl, Sonalan, Dual, Valor, Cadre); soil fungicides; and insecticide (Lorsban). Without timely rain or irrigation these inputs can be wasted. Irrigation lowers soil temperatures, which allows for normal peg development and greatly reduces aflatoxin risk.

Irrigation is also the best insect control available in that it makes the peanut plant much less susceptible to some of the most costly pests: lesser cornstalk borer, burrower bugs, corn earworm, and spider mites.

IRRIGATION SCHEDULING

The peanut growing season can be divided into five intervals based on the potential need for irrigation.

Timing	Rate	Significance
At-planting	0.5" if needed	Stand establishment. Pre-emergence herbicide infiltration / activity.
Emergence-45 DAP (pegging)	0.5" if needed	Enhance post-emergence herbicide activity (e.g. Cadre).
45-60 DAP (peg.-early pod-fill)	0.75 - 1.0" per week (minus rain)	Land plaster infiltration and solution. Maintain pegging. Prevent lesser cornstalk borer damage.
60-110 DAP (pod-fill)	1.5" per week (minus rain)	Fill pods. Peak water use occurs at about 75 DAP. Keep calcium in soil solution. Move fungicides into the soil. Suppress corn earworm, spider mites, and some soil insects (lesser cornstalk borers, burrower bugs).
110-125 DAP	0.75 - 1.0" as needed to prevent wilting.	Avoid late season drought stress and prevent aflatoxin. Provide adequate soil moisture for digging.

An alternative to the above rule-of-thumb method is a computer program (Irrigator Pro) based on monitoring soil temperature.

NEMATODES

Fortunately nematodes have been a relatively minor problem on peanuts in S. C. Peanut rootknot (race 1) nematode is capable of causing severe losses, but economic injury has been very rare in S. C. Lesion nematode frequently causes cosmetic hull injury on green peanuts and can cause yield reduction. Crop rotation is critical to minimizing nematode problems. Peanuts are an excellent rotation crop to suppress southern root-knot and Columbia lance nematodes in cotton.

Nematode control is not recommended for peanuts in S. C. unless economic injury to peanuts has been documented in a specific field. Banded applications of high Temik rates (10-14 lb/ac) are needed to suppress nematodes.

Field Crop Hosts for Common Nematodes

Crop	Root-knot				Lesion	Lance	Soybean Cyst	Sting	Ring
	southern	peanut race 1	peanut race 2	northern					
Peanut	-	+	-	+	+	-	-	+	+
Cotton	+	-	-	-	+	+	-	+	+
Corn	+	+	+	+	+	+	-	+	+
Soybean	+	+	+	+	+	+	+	+	+
Tobacco	+	+	+	+	+	-	-	-	+
Small Grain	+	+	+	+	+	+	-	+	
				- (wheat)					
Tomato	+	+	+	+	+	-	-	+	+

+ indicates host; - indicates non-host

Adapted by J. Mueller, Clemson Extension Plant Pathologist from: Powell, W. M. 1990. Plant susceptibility to major nematodes in Georgia. Univ. of Georgia Extension Bulletin 904; and Dickerson, O. J., J. H. Blake, and S. A. Lewis. 2000. Nematode guidelines for South Carolina. Clemson Univ. Extension Circular 703.

WEED MANAGEMENT

General Information

Successful weed management in peanut requires timely, effective herbicide inputs or cultivation to reduce weed competition for space, light, water, and nutrients. Peanuts do not compete well with weeds and should be maintained weed-free for 45 days after planting and monitored for escapes until canopy closure. Late season weeds may not be as competitive, but can cause digging loss, reduce grade by increasing loose shelled kernels (LSKs), and replenish the weed seed bank for subsequent years.

A successful weed management plan will use multiple production methods to keep weed populations low. Tillage and seedbed preparation or effective burndown herbicides should eliminate all emerged weeds prior to planting. **Never plant peanuts into green pigweeds and expect to apply glyphosate pre-emergence. Soil will cover small pigweeds during planting and they will escape control to be a problem all year.** The following sections will guide you in the decision making process.

Cultivation

Cultivation is an economical method for early season weed control in peanut and needs to be performed prior to canopy closure and/or when peanuts begin to peg. Mechanical cultivation is beneficial when herbicides are not effective or if an organic production system is required. Do not throw soil to the peanut crown during cultivation.

Weed Management Strategies

The following weed management plans are recommended for peanut production in South Carolina. Remember, it is important to understand the weed spectrum in your production system. Each herbicide program has strengths and weaknesses. These recommendations can further be tailored to suit your particular weed spectrum needs based on the Weed Response to Herbicides for Peanut table. Please refer to the tables following this section for use rates and precautions for these products.

Example Peanut Weed Control Programs

Appl. Timing	Gramoxone Program		Valor Program		Cadre Program		Valor + Cadre Program	
	Conventional Tillage	Strip-Till	Conventional Tillage	Strip-Till	Conventional Tillage	Strip-Till	Conventional Tillage	Strip-Till
PPI	Prowl or Sonalan (Dual can be added PPI for nutgrass)	None	Prowl or Sonalan (Dual can be added PPI for nutgrass)	None	Prowl or Sonalan	None	Prowl or Sonalan	None
PRE	*Dual (Prowl or Sonalan can be applied PRE under irrig.)	Prowl + *Dual or Sonalan + *Dual	Valor + *Dual (+ Prowl, Sonalan, or Dual if not applied PPI)	Valor + *Dual + Prowl or Sonalan	*Dual (Prowl or Sonalan can be applied PRE under irrig.)	Prowl + *Dual or Sonalan + *Dual	Valor 2-3 oz + *Dual (+ Prowl, Sonalan, or Dual if not applied PPI)	Valor 2-3 oz + *Dual + Prowl or Sonalan
Cracking or First Flush	Gramoxone + Basagran (or Storm)	Gramoxone + Basagran (or Storm)	if needed Gramoxone + Basagran	if needed Gramoxone + Basagran	Gramoxone + Basagran (or Storm)	Gramoxone + Basagran (or Storm)	if needed Gramoxone + Basagran	if needed Gramoxone + Basagran
POST	Gramoxone + Basagran (or Storm) by 28 d post emerg.	Gramoxone + Basagran (or Storm) by 28 d post emerg.	Gramoxone + Basagran (or Storm) by 28 d post emerg. if needed	Gramoxone + Basagran or Storm by 28 d post emerg. if needed	Cadre ~ 30-35 DAP	Cadre ~ 30-35 DAP	Cadre ~ 30-35 DAP	Cadre ~ 30-35 DAP
If needed	2,4-DB	2,4-DB	2,4-DB	2,4-DB	2,4-DB	2,4-DB	2,4-DB	2,4-DB
	Ultra Blazer or Cobra	Ultra Blazer or Cobra	Ultra Blazer or Cobra	Ultra Blazer or Cobra	Ultra Blazer or Cobra	Blazer or Cobra	Ultra Blazer or Cobra	Ultra Blazer or Cobra
	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus	Select or Poast Plus

RATES: Prowl 2.4 pt, Sonalan 2pt, Dual Magnum 1-1.3 pt, **Gramoxone Max 5.6 oz = Gramoxone Inteon 8 oz**, Basagran 0.5-1pt, 2,4-DB 16 oz, Valor 2-3 oz, Cadre DG 1.4 oz, Cadre 2L 4 oz, **Cobra 12.5 oz**, Ultra Blazer 1.5 pt, Storm 1.5 pt, Select 6-8 oz (16 oz for bermudagrass), Poast Plus 1.5 pt.

*** Dual can be added to Gramoxone + Basagran treatments up to 28 days post-emergence instead of (or in addition to) using Dual PRE. Post-emergence Dual treatments extend the residual control of pigweed. However, DO NOT USE THE DUAL II MAGNUM (OR CINCH) FORMULATIONS AFTER PEANUTS EMERGE.**

PEANUT WEED CONTROL

Eric P. Prostko, Univ. of Georgia Extension Weed Science

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
EARLY PREPLANT FOLIAR BURNDOWN OF EMERGED ANNUAL WEEDS AND/OR COVER CROPS IN REDUCED TILLAGE SYSTEMS			
glyphosate (various trade names) 3.00 lb ae/gal 3.73 lb ae/gal 4.00 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5.00 lb ae/gal	16 - 48 ozs 13 - 39 ozs 12 - 36 ozs 11.7 - 35 ozs 11 - 32 ozs 10 - 29 ozs	0.38 to 1.13 ae	Apply any time prior to planting to control emerged weeds. Refer to specific label for weeds controlled, application rates, adjuvants, and precautions. Glyphosate does not adequately control cutleaf eveningprimrose or Carolina geranium, and may not provide acceptable control of wild radish. For cover crop control, use the following rates: wheat ≤ 6", 0.38 lb ae/A; wheat > 6" or rye ≤ 20", 0.56 lb ae/A; rye > 20", 0.75 lb ae/A. Glyphosate can also be tank-mixed with Valor (1-3 ozs/A) or Aim (1-1.5 ozs/A) to improve the spectrum of control, particularly for annual morningglories. Refer to specific comments for Valor. Applications to wheat should be made before the boot stage or after the wheat is fully headed. MOA = 9.
glyphosate (various trade names) 3.00 lb ae/gal 3.73 lb ae/gal 4.00 lb ae/gal 4.17 lb ae/gal 4.50 lb ae/gal 5.00 lb ae/gal + 2,4-D amine (various trade names) 3.8 lb/gal	16 - 48 ozs 13 - 39 ozs 12 - 36 ozs 11.7 - 35 ozs 11 - 32 ozs 10 - 29 ozs + 0.5 to 1.0 pt	0.38 to 1.13 ae 0.24 to 0.48	Refer to comments for glyphosate applied alone. 2,4-D is the most cost-effective option available for burndown of cutleaf eveningprimrose. 2,4-D does not control Carolina geranium. Some 2,4-D products are labeled for application to previous crop stubble or fallow land. In this case, the label directs the user to not plant a crop "until 3 months after application or until the product disappears from the soil". MOA = 9 + 4.
paraquat (Gramoxone Inteon) 2.0 lb/gal (Gramoxone Max/ Firestorm/Parazone) 3.0 lb/gal	2.5 to 3.75 pt 1.7 to 2.5 pt	0.63 to 0.94	Apply anytime prior to planting to control emerged weeds. Add non-ionic surfactant at 1 pt/100 gals or crop oil at 1 gal/100 gals. Paraquat will not adequately control horseweed, swinecress, purslane speedwell, curly dock, cutleaf eveningprimrose and larger wild radish. For cover crop control, use the following rates: wheat, 0.63 lb ai/A (2.5 pt/A of 2.0 lb/gal or 1.7 pt/A of 3.0 lb/gal); rye, 0.49 lb ai/A (1.95 pt/A of 2.0 lb/gal or 1.3 pt/A of 3.0 lb/gal). Cover crops must be mature (seedheads) for adequate control. Can also be tank-mixed with Valor (1-3 ozs/A) to improve the spectrum of control and provide residual weed control. Refer to specific comments for Valor. MOA = 22.
paraquat (Gramoxone Inteon) 2.0 lb/gal (Gramoxone Max/ Firestorm/Parazone) 3.0 lb/gal + 2,4-D amine (various trade names) 3.8 lb/gal	2.5 to 3.75 pt 1.7 to 2.5 pt 0.5 to 1.0 pt	0.63 to 0.94 0.24 to 0.48	Refer to comments for paraquat applied alone. 2,4-D is the most cost-effective option available for burndown of cutleaf eveningprimrose. 2,4-D does not control Carolina geranium. Some 2,4-D products are labeled for application to previous crop stubble or fallow land. In this case, the label directs the user to not plant a crop "until 3 months after application or until the product disappears from the soil". MOA = 22 + 4.
PREPLANT SOIL INCORPORATED			
ethalfluralin (Sonalan) HFP 3.0 lb/gal	2 pt	0.75	Controls annual grasses and small-seeded broadleaf weeds. Soil incorporate 2 to 3 inches deep within 2 days of application. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. May be tank-mixed with Frontier/Outlook or Dual for control of mixed infestations of annual grasses and nutsedge. <i>Sonalan may also be applied as a surface application to freshly prepared seedbeds but must be incorporated by 0.5-1.0" of rainfall or irrigation within 2 days after application.</i> MOA = 3.

PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
PREPLANT SOIL INCORPORATED (cont.)			
pendimethalin (Prowl/Pendimax) 3.3 lb/gal (Prowl H ₂ O) 3.8 ACS	1.8 to 2.4 pt 2.0 pts	0.75 to 1.0 0.95	Controls annual grasses and small-seeded broadleaf weeds. Soil incorporate 1 to 2 inches deep within 7 days of application. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. Use high rate for Texas panicum or where heavy weed populations are anticipated. May be tank-mixed with Frontier/Outlook, Dual, or Pursuit for control of mixed infestations of annual grasses and nutsedge. <i>Prowl can be applied immediately after planting to a freshly prepared seedbed up to 2 days after planting but before crop emergence. However, adequate incorporation in the form of 0.75" of irrigation or rainfall is needed within 48 hours for optimum activation when applied by this method. In strip- tillage production systems, the rate of pendimethalin should be increased to 3.0 pts/A (Prowl 3.3EC) or 2.6 pts/A (Prowl H₂O). MOA = 3.</i>
dimethenamid- P (Outlook/Propel) 6.0 lb/gal	12 to 21 oz	0.56 to 0.98	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Suppresses yellow nutsedge but not purple nutsedge. May be tank-mixed with Prowl/Pendimax or Sonalan for control of mixed infestations of annual grasses and yellow nutsedge. PPI treatments generally provide better control of yellow nutsedge. MOA = 15.
metolachlor (Stalwart, Parallel PCS, Me- Too Lachlor) S-metolachlor (Dual Magnum 7.62EC) (Dual II Magnum 7.64EC) (Cinch 7.64EC)	1.0 to 1.33 pt 1.00 to 1.33 pt	1.0 to 1.33 0.96 to 1.27	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds and may provide limited Florida beggarweed suppression. Controls or suppresses yellow nutsedge but not purple nutsedge. Incorporation with implements other than power tiller requires two passes, preferably at cross angles. Deep incorporation may reduce effectiveness. May be tank-mixed with Prowl/Pendimax or Sonalan for control of mixed infestations of annual grasses and yellow nutsedge. PPI treatments generally provide better control of nutsedge. Heavy rainfall after planting and/or non-uniform incorporation may result in crop injury expressed as delayed emergence and stunted growth of emerging plants. The generic formulations of metolachlor (Parallel PCS, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15
diclosulam (Strongarm) 84WG	0.45 oz	0.024	Provides general broadleaf weed control. Incorporate into top 1-3" of final seedbed. Good to excellent control of many species including bristly starbur, wild poinsettia, eclipta, and copperleaf. Should be tank-mixed with a grass herbicide. Poor control of sicklepod. Control of nutsedge has been variable and inconsistent. Can also be applied preemergence. Crop rotation restrictions: cotton = 10 months; soybeans = 0 months; wheat, barley = 4 months; oats, rye = 6 months; corn = 18 months (10 months - IR hybrids); tobacco, sorghum = 18 months; other crops = 30 months. MOA = 2.
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	4 oz 1.44 oz	0.063	Controls purple and yellow nutsedge, wild poinsettia, wild radish, pigweed, burgherkin, and several other annual species. Does not control Florida beggarweed or sicklepod. <u>Shallow</u> incorporation is preferred. May be tank- mixed with Dual, Prowl/Pendimax, or Sonalan. Incorporated treatments are more persistent than preemergence or postemergence applications and are more likely to result in carryover. Rotation intervals for various crops include the following: lima beans, southern peas, soybeans, peanuts, IMI corn hybrids - 0 months; wheat, rye - 4 months; field corn - 8.5 months; barley, tobacco - 9 months; bahiagrass, cabbage, canteloupe, cotton, cucumber, Irish potato, lettuce, oats, onion, sorghum, sunflower, sweet corn, sweet potato transplants, sweet pepper transplants, tomato transplants; and watermelon - 18 months; canola - 40 months. MOA = 2.

PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
CHEMIGATION			
metolachlor - (Stalwart, Parallel PCS, Me-Too-Lachlor), S-metolachlor - (Dual Magnum 7.62E), (Cinch 7.64EC) pendimethalin - (Prowl/Pendimax) 3.3EC (Prowl H ₂ O 3.8ACS)			May be applied by injection through center pivot irrigation systems. Use at normal recommended rates. Apply after planting but before crop emergence. Requires proper system calibration and safety devices (check valves, cutoff switches, etc.) to provide effective weed control and prevent environmental contamination. Accurate herbicide application through chemigation may provide superior weed control compared to conventional ground applications. The generic formulations of metolachlor (Parallel PCS, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.
PREEMERGENCE			
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	4 fluid oz 1.44 oz	0.063	See comments for Pursuit PPI. Controls the same weeds as listed for Pursuit PPI but with greater dependency on rainfall or irrigation for activation. MOA = 2.
metolachlor (Stalwart, Parallel PCS, Me-Too-Lachlor)	1.0 to 1.33 pt	1.0 to 1.33	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Provides some suppression of sicklepod and Florida beggarweed. Apply after planting and before crop and weeds emerge. If Dual is used as a PPI treatment, any additional application of Dual should be delayed until peanuts begin emerging (AC). Multiple applications--preplant incorporated followed by at-cracking treatments--improve control of sicklepod, Florida beggarweed, and yellow nutsedge. Preemergence treatments generally provide better broadleaf weed control/suppression. Up to 2 pts/A of any metolachlor formulation can be applied preemergence for the partial control of Florida beggarweed in the southeast Do not apply more than 2.66 pts/A/year of Stalwart/Parallel/Me-Too-Lachlor or 2.8 pts/A/year of Dual Magnum/Dual II Magnum/Cinch formulation. The generic formulations of metolachlor (Parallel, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15.
S-metolachlor (Dual Magnum 7.62EC) (Dual II Magnum 7.64EC) (Cinch 7.64EC)	1.0 to 1.33 pt	0.96 to 1.27	
dimethenamid-P (Outlook/Propel) 6.0 lb/gal	12 to 21 oz	0.56 to 0.98	Controls some annual grasses (not Texas panicum) and small-seeded broadleaf weeds. Provides some suppression of sicklepod, Florida beggarweed. Apply after planting and before crop and weeds emerge. May be used in a split application method. Preemergence treatments generally provide better broadleaf weed control/suppression. Do not exceed 21 oz/A/year of Outlook/Propel 6E. MOA = 15.
diclosulam (Strongarm) 84WG	0.45 oz	0.024	Refer to PPI section. MOA = 2.
flumioxazin (Valor) 51WP	3.0 oz	0.096	Apply immediately after planting but no later than 2 days after planting. Plant peanuts at least 1.5" deep. DO NOT irrigate when peanuts are cracking. Rainfall or irrigation at cracking will cause temporary crop injury that should not result in reduced yields if applied according to the label. Valor will provide good to excellent control of many broadleaf weeds including Florida beggarweed, Palmer amaranth, and tropic croton. Valor will not control annual/perennial grasses, sicklepod, nutsedge, and cocklebur. Valor can be tank-mixed with Prowl, Sonalan, Dual Magnum, or Outlook. Can also be used in strip-tillage peanut production systems in combination with glyphosate or paraquat to improve burndown control. Rotation restrictions include the following: cotton - 2 months; field corn - 2 months; soybeans - 0 months; tobacco - 2 months; wheat - 2 months. Refer to current product label for additional rotational restrictions. Completely clean spray equipment THE SAME DAY OF USE as directed on the herbicide label!!!! MOA = 14.

PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
AT CRACKING OR EARLY POSTEMERGENCE			
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	4 fluid oz 1.4 4 oz	0.063	See comments for Pursuit PPI and PRE. Provides effective control of nutsedge, wild poinsettia, wild radish, bristly starbur, prickly sida, and several other annual species. Weed size is especially critical for effective control of nutsedge, bristly starbur, and prickly sida. If weeds are emerged, surfactant or crop oil concentrate should be included. May be tank-mixed with paraquat or 2,4-DB for broader spectrum control of emerged weeds. MOA = 2.
metolachlor (Stalwart, Parallel PCS, Me- Too-Lachlor)	1.0 to 1.33 pt	1.0 to 1.33	See comments for Dual PPI and PRE. Compared to PPI and PRE treatments, AC applications provide better control of non-emerged broadleaf weeds such as Florida beggarweed and sicklepod. May be tank-mixed with paraquat treatments for improved contact activity and for suppression/control of problem broadleaf weeds and yellow nutsedge. May also be tank-mixed with Basagran, Basagran + 2,4-DB, or Storm. Do not use Dual II Magnum/Cinch formulations after peanut emergence. Do apply more than 2.66 pts/A/year of Stalwart/Parallel/Me-Too-Lachlor or 2.8 pts/A/year of Dual Magnum. Research has shown that Dual will provide good to excellent residual control of tropical spiderwort if applied before weed emergence. Do not apply within 90 days of harvest. The generic formulations of metolachlor (Parallel PCS, Stalwart, Me-Too-Lachlor) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials. MOA = 15.
S-metolachlor (Dual Magnum) 7.64 lb/gal	1.0 to 1.33 pt	0.96 to 1.27	
paraquat (Gramoxone Max/ Firestorm/Parazone) 3.0 lb/gal (Gramoxone Inteon) 2.0 lb/gal	5.4 fluid oz 8.0 fluid oz	0.125	Provides effective contact control of sicklepod, Florida beggarweed, Texas panicum, and many other problem weeds. When used alone, paraquat is not effective on smallflower morningglory, prickly sida, wild radish, or tropic croton. Apply anytime <u>up to 14 days after ground crack</u> . After 14 days after ground crack, apply in combination with Basagran or Strom. Include surfactant at 1 pt/100 gal spray solution with all paraquat treatments. Do not make more than 2 applications per season. Do not apply a total of more than 10.8 ozs/A/year (Gramoxone Max) or 16.0 ozs/A/year (Gramoxone Inteon). Peanut foliage injury is usually temporary. Conditions of high humidity, wet foliage, and/or wet soils result in greater foliage burn. Thrips injury retards crop recovery. Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed. The success of “at-crack” sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI). Rain-free period for paraquat is 30 minutes. MOA = 22.
paraquat (Gramoxone Max/ Firestorm/Parazone) 3.0 lb/gal (Gramoxone Inteon) 2.0 lb/gal + bentazon+acifluorfen (Storm) 4.0 lb/gal	8.0 fluid oz 12.0 fluid oz + 1-1.5 pt	0.188 + 0.5 + 0.25	Provides effective, broad-spectrum weed control. Provides some suppression of yellow nutsedge. Addition of Dual or Frontier/Outlook improves contact activity and provides residual weed suppression/control, but could result in increased foliar peanut burn. Apply anytime <u>up to 28 days after ground crack</u> . Include surfactant at 1 pt/100 gal spray solution with all paraquat treatments. The success of “at-crack” sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI) Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed MOA = 22 + 6 +14.

PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		REMARKS AND PRECAUTIONS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
AT CRACKING OR EARLY POSTEMERGENCE (cont.)			
paraquat (Gramoxone Max/ Firestorm/Parazone) 3.0 lb/gal	8.0 fluid oz	0.189	Provides effective, broad-spectrum weed control. Provides some suppression of yellow nutsedge. Generally reduces peanut injury compared to other paraquat treatments. The lower rate of Basagran (0.5 pt) is usually sufficient to reduce peanut foliar burn and provide control of smallflower morningglory. The higher rate (1 pt) is necessary for control of weeds such as bristly starbur and prickly sida. Addition of Dual or Frontier/Outlook improves contact activity and provides residual weed suppression/control. Apply anytime <u>up to 28 days after ground crack</u> . Include surfactant at 1 pt/100 gal spray solution with all paraquat treatments. The success of "at-crack" sprays can be greatly improved by 1) applying herbicides in a minimum of 15 GPA; 2) using flat fan nozzles; 3) decreasing ground speed; and 4) using lower spray pressures (30 PSI). . Research indicates no adverse effects of adding chlorothalonil products with paraquat tank-mixtures where fungicide treatments are needed. MOA = 22 + 6.
(Gramoxone Inteon) 2.0 lb/gal +	12.0 fluid oz +	+	
bentazon (Basagran, Depend, Leader) 4.0 lb/gal	0.5 to 1.0 pt	0.25 + 0.5	
diclosulam (Strongarm) 84WG	0.45 ozs	0.024	24(c) label for use in Georgia. Only weed on current 24(c) label is tropical spiderwort. Can be applied up until 30 days after planting. Use in combination with a NIS @ 0.25% v/v (1 qt/100 gals). When applied postemergence in peanut, cotton rotation restriction is 18 months. Follow other rotation restrictions listed in PPI section. Label must be in the possession of user at the time of application. MOA = 2.
POSTEMERGENCE			
acifluorfen (Ultra Blazer) 2L 2.0 lb/gal	0.5 to 1.5 pt	0.125 to 0.38	Especially useful for control of morningglories, tropic croton, wild radish, wild poinsettia, hophornbeam copperleaf, and spider flower. Adjust rate according to weed size and species as noted on the label. Use 1.0 pt/A or less for control of highly sensitive species such as hemp sesbania and showy crotalaria. Slight to moderate peanut foliage burn may result. Observations over the past several years indicate that newer amine formulation may be less injurious than older sodium salt formulation. Do not apply within 75 days of harvest or more than 2 pt/A per season as a postemergence treatment. Apply with nonionic surfactant at 1 qtt/100 gal spray solution (0.25% v/v). May be tank-mixed with 2,4-DB (1 pt/A). The Blazer + 2,4-DB tank mixture is generally more injurious to peanuts than either product alone. May be tank-mixed with Basagran for control of broadleaf weeds such as morningglories, cocklebur, and prickly sida. A pre-packaged mix of acifluorfen + bentazon is marketed as Storm. Rain-free period for Ultra Blazer is 4 hours. MOA = 14.
bentazon (Basagran) 4.0 lb/gal	1.5 to 2.0 pt	0.75 to 1.0	Apply for postemergence control of yellow nutsedge, cocklebur, bristly starbur, smallflower morningglory, prickly sida, and certain other weeds. Treat when broadleaf weeds are small and actively growing. Adjust rate according to weed size as noted on label. Two applications may be required for control of yellow nutsedge. For yellow nutsedge, include crop oil concentrate at 1 qt/A. Do not foliarly apply sulfur 14 days before or after use of crop oil concentrate to minimize risk of peanut foliage burn. May be tank-mixed with 2,4-DB amine 2L (0.5 pt/A) for improved control of morningglories. Early-season applications of bentazon at high rates following in-furrow applications of Di-Syston may infrequently result in SEVERE peanut injury. Rain-free period for Basagran is 4 hours. MOA = 6.

bentazon + acifluorfen (Storm) 4 lb/gal	1.5 pt	0.5 + 0.25	Controls morningglories, cocklebur, prickly sida, ragweed, eclipta, tropic croton, and several other broadleaf weeds with less injury than Blazer alone. Application timing is critical--weeds must be small. Include surfactant or crop oil concentrate. Can be mixed with 2,4-DB for control of larger weeds and for control of sicklepod. Do not apply within 75 days of harvest. May be tank-mixed with paraquat. Rain-free period for Storm is 4 hours. MOA = 6 + 14.
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PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		PRECAUTIONS AND REMARKS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
POSTEMERGENCE continued			
2,4-DB (Butyrac 175) 1.75 lb/gal (Butyrac 200) 2.0 lb/gal (Butoxone 175) 1.75 lb/gal (Butoxone 200) 2.0 lb/gal	14 to 18 oz 13 to 16 ozs 16 to 28 ozs 14 to 26 ozs	0.19 to 0.25 0.20 to 0.25 0.22 to 0.38 0.22 to 0.40	Apply up to 2 applications per season as an over-the-top treatment for broadleaf weed control. Use rates and application timing varies by specific product label. For control of morningglory and citrormelon, apply in the seedling stage. Cocklebur one foot or more in height can be controlled; however, earlier treatment is preferred. Also effective for control of escaped sicklepod. Do not apply if peanuts are under drought stress. Butyrac may be applied up to 12 weeks after planting. Do not apply Butoxone within 30 days of harvest. Research indicates no adverse effects of adding chlorothalonil products with 2,4-DB where fungicide treatments are needed. Rain-free period for 2,4-DB is 1 hour. Do not tank-mix with postemergence grass herbicides. MOA = 4.
imazethapyr (Pursuit) 2.0 lb/gal 70 DG	4 fluid oz 1.44 oz	0.063	See comments for Pursuit PPI, PRE, and AC/EP. Generally should be used early postemergence-when weeds are extremely small. Controls wild radish, pigweeds, morningglories, cocklebur, and several other annual species. Compared to PPI, PRE, and AC/EP treatments, POST applications are less effective on nutsedge, wild poinsettia, and some other species. Applications should be made before nutsedge exceeds 3 to 4 inches and bristly starbur exceeds 2 inches. May be tank-mixed with paraquat or 2,4-DB. Post control of escaped wild poinsettia is greatly enhanced in combination with paraquat. Rain-free period for Pursuit is 1 hour. Do not apply within 85 days of harvest. MOA = 2.
imazapic (Cadre)70DG (Cadre/Impose) 2AS	1.44 oz 4.0 oz	0.063	Provides excellent control of many broadleaf and grass weeds and both purple and yellow nutsedge. Apply as an early postemergence treatment when weeds are less than 2-3 inches in height. Under conditions of heavy weed pressure, applications of Cadre 10-14 days following an at-cracking treatment (paraquat combination) has resulted in superior weed control. Do not apply within 90 days of harvest. Use with NIS (0.25% v/v) or COC (1 qt/A). Rotation restrictions include: wheat, rye - 4 months; corn, snapbeans, southern peas, soybeans, tobacco - 9 months; cotton, oats, sweet corn, grain sorghum - 18 months; canola - 40 months. See label for additional restrictions. Rain-free period for Cadre is 3 hours. MOA = 2.
lactofen (Cobra 2EC)	12.5 ozs	0.195	Apply after peanuts reach 6 true leaf stage of growth. Use a crop oil concentrate at 1% v/v (1 gal/100 gals). Provides good control of pigweeds, morningglories, ragweed, copperleaf, wild poinsettia, and eclipta. Cobra can be tank-mixed with Basagran, Cadre, Pursuit, Select, and 2,4-DB. Preharvest interval is 90 days. Rain-free period is 30 minutes. MOA = 14.
sethoxydim (Poast) 1.5 lb/gal (Poast Plus) 1.0 lb/gal	1.0 to 1.5 pt 1.5 to 2.25 pt	0.19 to 0.28	For control of annual and perennial grasses. Apply when annual grasses are small (1-6 inches) and actively growing. Under favorable conditions, large Texas panicum can be controlled. For perennial grass control, two applications are usually required for satisfactory control. Always apply with 1 qt/A crop oil concentrate. Tank-mixtures with other herbicides, such as 2,4-DB, may reduce grass control. Do not foliarly apply sulfur 14 days before or after application to minimize risk of peanut foliage burn. Reduced spray volumes (10 GPA) may improve grass control. Do not apply within 40 days of harvest. Rain-free period for Poast is 1 hour. MOA = 1.
clethodim (Select, Arrow, others) 2EC (Select Max) 0.97EC	6 to 8 oz 12 to 16 oz	0.09 to 0.125	For control of annual and perennial grasses. Apply when grasses are small (<6 inches) and actively growing. Under favorable conditions, large Texas panicum and bermudagrass can be effectively controlled. Heavy bermudagrass pressure or larger Texas panicum will require a follow-up treatment. When tank-mixing with a broadleaf herbicide or controlling perennial grasses, increase rates (8-16 ozs/A-Select; 16-32 oz/A-Select Max). Do not apply more than 32 oz/A/year (Select) or 64 oz/A/year (Select Max). Always apply with a crop oil concentrate at 1% v/v (Select/Arrow). A NIS (0.25% v/v) can be used with Select Max to reduce crop injury potential. May be tank-mixed with Basagran, Blazer, Storm,

			Orthene, Danitol, or Folicur. Do not tank-mix with chloro-thalonil products or reduced grass control can occur. Do not apply within 40 days of harvest. Rain-free period is 1 hour. MOA = 1.
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PEANUT WEED CONTROL (continued)

USE STAGE/ AND HERBICIDE	BROADCAST RATE/ACRE		PRECAUTIONS AND REMARKS
	AMOUNT OF FORMULATION/A	LBS ACTIVE INGREDIENT/A	
POSTEMERGENCE continued			
chlorimuron (Classic) 25DF	0.5 oz	0.008	Make one application per season as an over-the-top treatment for mid-season Florida beggarweed and bristly starbur control or suppression. Under favorable conditions--good soil moisture, moderate temperatures, and high relative humidity--other species such as cocklebur, ragweed, and sicklepod may be suppressed. Avoid applications during periods of drought/heat stress because of potential for poor weed control and crop injury. Applications of Classic may not provide acceptable control of Florida Beggarweed that has escaped control or is regrowing after an previous application of Cadre. Include nonionic surfactant at 1 qt/100 gals spray solution with all Classic applications. Addition of ammonium sulfate (2 lb/A) or feed grade urea (2 gal/A) improves activity on bristly starbur. Classic can be applied from 60 days after peanut emergence to within 45 days of harvest. APPLICATIONS OF CLASSIC APPLIED FROM 60 DAYS AFTER CROP EMERGENCE TO 45 DAYS BEFORE HARVEST MAY CAUSE AN INCREASE IN TSWV SYMPTOMS. Temporary yellowing of peanut foliage and reduction of canopy growth sometimes occur. Can be tank-mixed with Bravo or 2,4-DB. However, combinations of Classic + 2,4-DB result in significantly more foliar crop injury compared to Classic alone. Do not use on Spanish peanut. Do not use the combination of Classic + 2,4-DB on Southern Runner. Do not tank-mix with elemental sulfur. Rain-free period for Classic is 1 hour. MOA = 2.
HARVEST AID			
carfentrazone (Aim) 2EC	1 - 2 oz	0.156 - 0.031	Useful for the late-season desiccation/defoliation of annual morningglories. Apply 7 days before harvest. Use in combination with either a NIS (0.25% v/v) or COC (1% v/v). Aim may cause leaf spotting or burning. Use at least 15 GPA for optimum results. The higher rate (2 oz/A) may be needed if smallflower morninglory is present. Do not graze or feed peanut hay to livestock. Only 1 application per season is permitted. Rain-free period = 6-8 hours . MOA = 14.

Crop Replant and Rotation Restrictions for Peanut Herbicides*.

	Corn	Cotton	Grain Sorghum	Peanuts	Soybeans	Sunflower	Tobacco	Wheat
Basagran	No information on label.							
Cadre	9 M	18 M	18 M	None	9 M	26 M	9 M	4 M
Classic	7 M	8 M	9 M	6 M	None	18 M	9 M	3 M
Dual Magnum	None						Spring	4.5 M
Gramoxone Max	None							
Frontier	None	Spring	Spring	None	None	Spring	Spring	4 M
Poast	Do not plant any crop for harvest within 120 D unless registered in that crop.							
Poast Plus	No information on label.							
Pursuit	8.5 M	9 M	18 M	None	None	18 M	9.5 M	4 M
Select	No information on label.							
Storm	No information on label.							
Strongarm	18 M	10 M	18 M	None	None	30 M	18 M	4 M
Ultra Blazer	No information on label.							
Valor	2 M	2 M	2 M	None	None	2 M	2 M	2 M
Zorial	18 M	None	18 M	30 D	45 D	18 M	18 M	18 M
2,4-DB	Replant in the same growing season with crops registered for 2,4-D use.							
M = Months; D = days								
*Replant table prepared by Chris Main, former Weed Scientist, Clemson University								

Weed Response to Burndown Herbicides Used in Peanut

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Weed Species	Burndown Treatment ¹							
	2,4-D ³	glyphosate acid	glyphosate acid ² + 2,4-D ³	glyphosate acid ² + Valor	glyphosate acid ² + Aim	paraquat	paraquat + 2,4-D	paraquat + Valor ⁴
GRASSES / SEDGES								
annual bluegrass	N	E	E	E	E	G-E	G-E	
bermudagrass	N	F	F	F	F	P	P	
crabgrass	N	E	G-E	E	E	G		
goosegrass	N	E	G-E	E	E	F-G		
Italian ryegrass	N	G-E	G	G	G	P-F	P-F	
johnsongrass	N	G-E	G	G-E	G-E	P		
little barley	N	E	E	E	E	G	G	
sandbur	N	E	G-E	E	E	G		
Texas panicum	N	E	G-E	E	E	G		
volunteer corn	N	E	E	E	E	F-G		
purple nutsedge	N	F-G	F-G	G	F-G	P-F		
yellow nutsedge	N	P-F	P-F	F	P-F	P-F		
BROADLEAVES								
bristly starbur	G	G-E	G-E	E	E	E		
buttercup	G	G-E	E	G-E	G-E	E		
Carolina geranium	F	P-F	G	G	F-G	G-E	G-E	
chickweed	P	E	E	E	E	E	E	
citronmelon	F	G-E	E	E	E	F		
cocklebur	E	E	E	E	E	G-E		
coffee senna	G	E	E	E	E	F		
corn spurry	P-F	G-E	G-E			F-G		
cowpea	G	E			E	E		
cudweed	P-F	G-E	G-E	E		F-G		
curly dock	P-F	F	F-G	F	F	P	P-F	
eveningprimrose	E	P-F	E	F-G	F	P-F	E	F-G
eclipta	P	F			G-E	F		G
Florida beggarweed	F-G	E	E	E	E	E		
Florida pusley	F	F	G	F-G	G	F		G
field pansy	P-F	F-G	F-G	G		G-E		
hemp sesbania	G-E	P-F	E		G-E	F		
henbit	P-F	F	G-E	E	E	G	G-E	
horsenettle	F	F			P-F	P-F		
horseweed	F-G	F-G ⁵	G-E	G-E ⁵	G-E ⁵	P	P-F	P
lambsquarters	E	G	E		G-E	F-G		

Weed Response to Burndown Herbicides Used in Peanut (continued)

Weed Species	Burndown Treatment ¹							
	2,4-D ³	glyphosate acid	glyphosate acid ² + 2,4-D ³	glyphosate acid ² + Valor	glyphosate + Aim	paraquat	paraquat + 2,4-D	paraquat + Valor ⁴
morningglory, Ipomoea	G	F	E	E	E	F-G		
morningglory, smallflower	F	G	E	E	G-E	P		
Pennsylvania smartweed	F	G	G		G-E	P		
pigweed	G-E	E	E	E	E	G		
prickly sida	F-G	F-G	G		F-G	P-F		
purslane	G-E	F-G	G-E	G	F-G	G		
ragweed	E	G	E		G-E	G		
redweed	F	G			G-E	F		
shepherdspurse	G	G			G	G	G-E	
sicklepod	F-G	G-E	E	E	G-E	E		
speedwell	P-F	G-E	G-E	E	E	F	G	
spurred anoda	F-G	G			G	F-G		
swinecress	F-G	F-G	G	F-G	F-G	P	P-F	
tropic croton	F	G-E	G-E	E	G-E	F		
tropical spiderwort	G-E	P	G-E	F	G-E	G	G-E	
velvetleaf	F-G	G			E	P		
vines (maypop, trumpet creeper, bigroot mg)	F	P-F			P-F	P		
Virginia pepperweed	G-E	G			G	P-F	G-E	
volunteer peanuts	P	F		F-G	F	P	P	G
wild lettuce	G	G	G-E	E	G-E	P		
wild poinsettia	F-G	G			G-E	G-E		
wild radish	G	F-G	E	G	G	F	F-G	G
COVER CROPS								
clover	F	F	F-G		F	F-G		
lupine	G	G	G		G	F-G		
small grains	N	E	G-E	E	E	G		G
vetch	G	F	G-E	F	F	F		

Key: E = 90% or better control; G = 80% to 90% control; F = 60% to 80% control; P = 30% to 60% control; N = < 30% control.

¹Application rates per acre: 2,4-D, 1 pt; glyphosate acid, 0.75 lb a.e.; paraquat (Gramoxone Inteon, Gramoxone Max, Firestorm), 0.63 lb a.i.; Valor, 1 to 2.0 oz (Note: if 3 oz/A of Valor is used, burndown control may be better than indicated and residual control will be increased)

²Mixing herbicides with glyphosate occasionally reduces grass control (including cover crops). This is more likely to occur with large weeds in dry conditions.

³Labels for 2,4-D are ambiguous concerning the waiting period between application and planting.

⁴Use a NIS (0.25% v/v) or COC (1% v/v) with this tank-mixture. A COC may be preferred if weeds are large

⁵Glyphosate resistant horseweed has been detected in neighboring states. Glyphosate will not control glyphosate resistant horseweed.

WEED RESPONSE TO HERBICIDES USED IN PEANUTS

Eric P. Prostko, Extension Agronomist - Weed Science

	I PPI/PRE ^{1,2}						PRE		POSTEMERGENCE	
	Prowl Pendimax Sonalan	Dual Magnum ³	Lasso Intro	Frontier Outlook	Pursuit	Strongarm	Solicam	Valor	Paraquat ⁴	Paraquat + Storm
Perennials										
bermudagrass	P	P	P	P	P	P	P	P	P	P
johnsongrass- rhizome	P	P	P	P	P	P	P	P	P	P
nutsedge, purple	P	P	P	P	G	P-F	P-F	P	P-F	F
nutsedge, yellow	P	F-G	F	F	F-G	P-F	P-F	P	P-F	F-G
Grasses (annual)										
broadleaf signalgrass	G-E	F-G	P	F	P	P	G	P	G	G
crabgrass	E	E	E	E	F	P	G-E	P	F-G	F-G
crowfootgrass	E	E	E	E	P	P	G	P	G	G
fall panicum	G	G	G	G	P-F	P	G	P	G	G
goosegrass	E	E	E	E	F	P	G	P	F-G	F-G
johnsongrass- seedling	E	F	F	F	G	P		P	G	G
sandbur	E	F-G	F-G	F-G		P		P	F	F-G
Texas panicum	G-E	P	P	P	P-F	P-F	P	P	G-E	G-E
Broadleaves										
bristly starbur	P	P	F	P	F	E	P-F	F	P-F	F-G
burgherkin	P	P	P	P	E	G	G	G	F	G
carpetweed	G	P-F	P-F	G	F-G	G	G		F-G	G
citronmelon	P	P	P	P	P	G		G	F	G
cocklebur	P	P	P	P	G-E	G-E	P-F	P	G	G-E
coffee senna	P	P	P	P	F-G	P	F	P-F	F	E
copperleaf	P	P		F-G	P	G-E		G-E	P	G
cowpea	P	P	P	P	P	P	P	P-F	F-G	F
crotalaria	P	P	P	P				G		F-G
croton, tropic	P	P	P-F	P	P	F-G	G	G	P	G
dayflower/tropical spiderwort	P	G-E		F		G	P-F	F	G	G
eclipta	P	P-F	P-F	P-F	P	G-E	P	G-E	P-F	F-G
Florida beggarweed	P	P-F	F	P-F	P	F-G	G	G-E	G-E	G-E
Florida pusley	E	G-E	G-E	G-E	G	G-E	G-E	G-E	P	P
groundcherry, cutleaf	P	G	G	G						
jimsonweed	P				G	G-E	F-G	G	P	F

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	I PPI/PRE ^{1,2}						PRE		POSTEMERGENCE	
	Prowl Pendimax Sonalan	Dual Magnum ³	Lasso Intrro	Frontier Outlook	Pursuit	Strongarm	Solicam	Valor	Paraquat ⁴	Paraquat + Storm
hairy indigo	P	F				G	G	G	F	
hemp sesbania	P	P	P	P	P	P-F	P	G		G
lambsquarters	E	F	F	G	F	G-E	F-G	G-E	F	F-G
morningglory spp.	P	P	P	P	G	F-G	P-F	F-G	P	F
cypressvine	P	P	P	P	G		F	G	F-G	F-G
entireleaf/ivyleaf	P	P	P	P	G	F-G	P	F-G	F	G
pitted	P	P	P	P	G	F-G	P	F	F	G
purple moonflower	P	P	P	P			P		F	G
red	P	P	P	P	G	F		G	F	G
smallflower	P	P	P	P	E	G	P-F	G-E	P	G-E
tall	P	P	P	P	G			F-G	F	G
pigweeds ^{5,6}	G-E	G-E	G-E	G-E	E	G	G	G	P	G-E
poorjoe										
prickly sida	P	F	F	F	G-E	F-G	G-E	G-E	F	G
purslane	G-E	G	G	G	G		F	G-E	G	G
ragweed	P	P	P	F-G	P	G-E	G	G-E	P-F	G
redweed	P					G	G-E	G-E	F	G
spurred anoda	P	P	P	P		F-G		F	P	G
sicklepod	P	P	F	P	P	P	F	P	G-E	G-E
smartweed	P				G	G		P-F	G-E	G
spider flower	P	P	P	P	G					
spurge spp.	P	P-F	P	P-F			F-G	G-E		
velvetleaf	P	P	P	P	P-F	G-E		F	F	F-G
wild poinsettia	P	P	P	P	E	G-E	P	F-G	F	G
wild radish	P	P	P	P	E		F		F	G

Abbreviations: E = Excellent (> 90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (< 70%). (If no letter is given, response is unknown.) PPI=Preplant Incorporated, PRE=Preemergence.

¹Ratings for Pursuit PPI and PRE are similar. ²Ratings for Dual, Lasso and Frontier PRE and AC are similar. See remarks for additional information.

³The generic formulations of metolachlor (**Parallel PCS, Stalwart, Me-Too-Lachlor**) have not provided the same length of residual control of certain weeds as similar rates of Dual Magnum formulations in some UGA field trials.

⁴Comercially available as Gramoxone Max/Firestorm or Gramoxone Inteon.

⁵Palmer amaranth control may be less than indicated.

⁶Control of ALS- resistant pigweed may be less than indicated with the following herbicides: Pursuit (imazethapyr), Cadre (imazapic), Classic (chlorimuron), and Strongarm (diclosulam).

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	POSTEMERGENCE											
	Paraquat + Basagran	2,4-DB	Pursuit	Basagran Others	Ultra Blazer	Cobra	Storm	Cadre	Strongarm**	Select	Poast	Classic
Perennials												
bermudagrass	P	P	P	P	P	P	P	P	P	G	F-G	P
johnsongrass	P	P	P	P	P	P	P	F-G	P	G	G	P
nutsedge, purple	F	P	G	P	P	P	P	G-E		P	P	P
nutsedge, yellow	F-G	P	F-G	G	P	P-F	F	G-E		P	P	F-G
Grasses												
broadleaf signalgrass	G	P	P	P	P	P-F	P	G	P	E	E	P
crabgrass	F-G	P	P-F	P	P	P-F	P	G	P	E	G-E	P
crowfootgrass	G	P	P-F	P	P	P	P	G	P	G-E	G	P
fall panicum	G	P	P	P	F	P	P	G	P	G	G	P
goosegrass	F-G	P	P	P	P	P	P	F	P	G	F-G	P
johnsongrass-seedling	G	P	F	P	P	P	P	F-G	P	G-E	G-E	P
sandbur	F-G	P		P	P	P-F	P	G	P	G-E	G	P
Texas panicum	G-E	P	P-F	P	P	P	P	F-G	P	G-E	G-E	P
Broadleaves												
bristly starbur	F	P-F	P-F	G	F	G	F-G	F	E	P	P	F
burgherkin	F	F	F	P	G	G	F	G-E		P	P	P
carpetweed	P	P	F-G	P	G-E	G-E	G	F-G		P	P	
citronmelon	F	G	P	P	F	G	F	G		P	P	P
cocklebur	G	E	E	E	G	G-E	E	E	E	P	P	F
coffee senna	E	F-G	F	G	P	P-F	F	G		P	P	P
copperleaf	P	P	P	P	G-E	G-E	F	P-F	P	P	P	P
cowpea	P-F	P-F	P	P	P-F	P-F	P-F	P-F		P	P	F
crotalaria				P	E	E	G-E			P	P	
croton, tropic	P	P	P	P	E	E	G-E	P	P	P	P	P
dayflower/tropical spiderwort	G			G				F-G	G	P	P	
eclipta	F	P	P	G	F-G	F-G	G	P-F	G-E	P	P	P
Florida beggarweed	G-E	P	P	P	P	P-F	P	F-G	P-F	P	P	F-G
Florida pusley	P	P	P	P	P	F-G	P	P		P	P	P
groundcherry, cutleaf	F-G			P	G	G	F-G			P	P	
jimsonweed	E	P	F-G	E	E	E	G	E		P	P	

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

	POSTEMERGENCE											
	Paraquat + Basagran	2,4-DB	Pursuit	Basagran Others	Ultra Blazer	Cobra	Storm	Cadre	Strongarm**	Select	Poast	Classic
hairy indigo		F	P	P	G	G	F	F		P	P	F-G
hemp sesbania			P	P	E	E	G-E	P		P	P	F-G
lambsquarters	F	F	P	F	P-F	P-F	F	P-F		P	P	P
morningglory spp.	F-G	F-G	G	F	G-E	G-E	G	G	G-E	P	P	
cypressvine	G-E	F	G	G	G	G-E	G	G		P	P	
entireleaf/ivyleaf		G	F-G	P	G	F-G	F	G	G-E	P	P	
pitted		F-G	G	P	G-E	G	F-G	G	G-E	P	P	
purple moonflower		F-G	P	P	G-E	F-G	G		G	P	P	P
red		G		F-G	G-E	G-E	G-E			P	P	
smallflower	G-E	F	E	E	G-E	G-E	G-E	E	G-E	P	P	
tall		G		P	G	G	F-G	G		P	P	
pigweeds ^{5,65}	G	F	E	P	E	E	G	E		P	P	P-F
poorjoe		F			G	G						
prickly sida	G	P	P-F	G	P	G	G	G		P	P	P
purslane	G	G	P-F	G	E	E	G-E	P-F		P	P	
ragweed	F	F	P	F	E	E	G	F	E	P	P	P-F
redweed	G	P	P	G	P	F	G	G		P	P	P
spurred anoda	F-G	P		G	P	P	F	G		P	P	
sicklepod	G	F-G	P	P	P	P-F	P	G-E	P	P	P	P-F
smartweed	G	P	G-E	G-E	G-E	G-E	G-E	F-G		P	P	P
spider flower			F-G		G	G	F	F-G		P	P	F
spurge spp.		P	P	P	F	F	F					P
velvetleaf	G	P	P-F	G	P-F	G	F-G			P	P	
wild poinsettia	G-E	P	P-F	P	G-E	G-E	G	E	P-F	P	P	P
wild radish	F	P	G-E	P-F	E	E	G	E	G-E	P	P	P

Abbreviations: E = Excellent (> 90%); G = Good (80-89%); F = Fair (70-79%); P = Poor (<70%). If no symbol is given, response is unknown. ⁴Palmer amaranth control may be less than indicated.

⁵Control of ALS- resistant pigweed may be less than indicated with the following herbicides: Pursuit (imazethapyr), Cadre (imazapic), Classic (chlorimuron), and Strongarm (diclosulam).

**24(c) label for use in Georgia only for tropical spiderwort.

WEED RESPONSE TO HERBICIDES USED IN PEANUTS (continued)

SUGGESTED HERBICIDE PROGRAM FOR THE CONTROL OF TROPICAL SPIDERWORT IN PEANUT:

AT-CRACK (before 28 days after peanut cracking): Apply Gramoxone Inteon (12 oz/A) or Gramoxone Max/Firestorm/Parazone (8 oz/A) + Basagran (8 oz/A) + Dual Magnum (12 oz/A*) or generic metolachlor (1 pt/A) **and**

POST (2-3 weeks after at-crack spray): Apply Cadre (1.44 oz/A of dry or 4 oz/A of liquid) or Strongarm (0.45 oz/A) + Dual Magnum (12 oz/A*) or generic metolachlor (1 pt/A).

**The 12 oz/A rate of Dual Magnum is only recommended when used in a 2 application program. If only 1 application of Dual Magnum will be made, the rate should be increased to at least 1 pt/A..*

Suggested Herbicide Programs for Managing ALS-Resistant Palmer Amaranth in Peanut.¹

Preplant Incorporated	Preemergence ²	Cracking or early postemergence ³ (Palmer < 2 in.)	Postemergence ⁴ (Palmer < 3 in.)
Prowl ⁵ or Sonalan	Valor ^{6,7}		Cobra ⁷ or Ultra Blazer ⁷
Prowl ⁵ or Sonalan	Valor ^{6,7} + Dual Magnum ⁸ or Outlook		Cobra ⁷ or Ultra Blazer ⁷
Prowl ⁵ or Sonalan		Paraquat + Storm + Dual Magnum ⁸ or Outlook	Cobra ⁷ or Ultra Blazer ⁷

¹ALS-resistant Palmer amaranth is a very serious concern. An aggressive management program is necessary to slow spread of the resistant biotypes and to reduce selection pressure in areas currently not infested with resistant biotypes. A combination of soil residual and postemergence herbicides will be required for optimum control.

²Strongarm is not included in this table because it is an ALS-inhibiting herbicide. However, it can be used for the control of other broadleaf weeds. If Strongarm is used preemergence, Cadre or Pursuit should **NOT** be applied postemergence.

³Apply cracking or early postemergence treatment only if weeds have emerged.

⁴Cadre or Pursuit may be tank-mixed with Cobra or Ultra Blazer if needed for control of other weed species. Cadre and Pursuit are ALS-inhibitors. Because of concerns with weed resistance to ALS-inhibitors, a mixture of Cobra or Ultra Blazer with Cadre or Pursuit would be preferred over Cadre or Pursuit alone. When using Cadre or Pursuit, follow all labeled crop rotation restrictions.

⁵Generic brands of Prowl (pendimethalin) are available and perform similarly. Prowl or Sonalan can be used preemergence if 0.5-0.75" of water can be applied within 48 hours of application. They can be tank-mixed with Valor in this situation.

⁶If Valor is properly activated with 0.5-0.75" of rainfall or irrigation within 7 days of application, it is unlikely that an "at-cracking" treatment will be required. However, if control with Valor is unacceptable, an "at-cracking" treatment of paraquat + Storm + Dual Magnum or Outlook should be applied.

⁷Valor, Cobra, Storm, and Ultra Blazer have the same mode of action (PPO inhibitor). Consequently, no more than 2 applications of these herbicides should be used in a season.

⁸Generic brands of metolachlor are available (Stalwart, Parallel PCS, Me-Too-Lachlor). However, these generic brands have not provided the same length of residual control as Dual Magnum (S-metolachlor) in some UGA field trials.

PEANUT DISEASE MANAGEMENT

Jay W. Chapin, Extension Specialist

Seedling Diseases: All peanut seed should be treated with a fungicide (**Vitavax PC**, **Dynasty PD**, or **Trilex**) to reduce the incidence of seed-transmitted and soilborne seedling diseases such as *Cylindrocladium*, *Aspergillus* crown rot, *Pythium*, and *Rhizoctonia*. **Vitavax PC** (Captan + PCNB + Carboxin), **Dynasty PD** (mefenoxam + fludioxonil + azoxystrobin), **Trilex Star** (Captan + trifloxystrobin + metalaxyl + thiophanate-methyl), and **Trilex Optimum** (Captan + trifloxystrobin + metalaxyl) seed treatments are all effective in reducing seedling disease and protecting stand counts. Higher stand counts reduce the risk of tomato spot wilt virus.

Tomato spotted wilt virus (TSWV): This virus is transmitted to peanuts by thrips, primarily tobacco thrips. TSWV reduces yield and causes shriveled, misshapen pods. All peanut fields in S. C. are vulnerable to significant yield loss from TSWV regardless of whether the farm has any history of peanut production.

A 6-step program is recommended to reduce TSWV.

The more of these six steps that are used in combination, the better the chances of minimizing TSWV yield loss.

1. **Varietal Resistance** – Varieties with partial resistance to TSWV are listed in the variety characteristic chart of the peanut production guide. No variety is immune.
2. **Planting Date Window** – Avoid April planting. Mid-May has less risk than May 1, but with large acreage, we must start planting the first week of May.
3. **Plant Population / Seeding Rate** - The goal is a uniformly emerged stand of at least 4 plants per row ft. Plant 6 seeds per row ft (or at least 5/ft for large seeded virginia types) into good soil moisture. Uniform emergence and vigorous early growth reduce virus risk.
4. **In-furrow Insecticides** – Both Thimet (Phorate) 20 G (4.4 lb/ac on 38 rows) and Temik 15G (5 lb/ac) reduce TSWV levels. Under heavy virus infection conditions Thimet (Phorate) is more effective against TSWV. See insecticide table for phorate rates by row spacing.
5. **Strip-tillage** - surface crop residue reduces the number of thrips landing in the field.
6. **Twin-row planting** - faster ground cover means less virus. For most growers, this is the least practical step because it requires a specialized planter.

Tomato Spotted Wilt Control: “It’s all over when the planter leaves the field”

Fungicide Programs for White mold, Limbrot, Leaf Spot, and Web Blotch:

The key to peanut disease control is preventing diseases from getting started. This is true for soil diseases such as white mold and Rhizoctonia limbrot, as well as leaf spot on the foliage. Alternating different fungicide chemistries reduces the potential for developing resistant strains of leaf spot and soil diseases. Alternating fungicides also gives some insurance against the failure of one product alone.

General guidelines for fungicide programs:

- Begin leaf spot control **absolutely no later than 45 DAP**. For highly susceptible varieties (Gregory, Phillips, Perry) particularly under irrigation, begin treatment at 30-35 DAP by adding a chlorothalonil fungicide (e.g. 1 pt Bravo) to Cadre herbicide application.
- **In high risk white mold fields (soybean, peanut history), apply a soil fungicide (Folicur, Abound, Moncut, Artisan, Provost or Headline) no later than 60 DAP**. White mold must be prevented, and hot weather accelerates white mold growth.
- Soil fungicides must be washed into the soil to be effective against white mold, but **wait 24 hr before irrigating** to also help control leaf spot.
- **DO NOT apply more than a combined total of 2 strobilurin applications** (Abound, Headline, Evito, or Stratego) in any growing season to reduce risk of resistance.
- **Never apply Topsin alone and do not make more than two tank-mixed Topsin applications per season**. This product is very susceptible to resistance. We will lose effectiveness quickly if we abuse it.
- **No fungicide program is fool-proof**. Spot check fields for leaf spot and white mold, particularly from 60 DAP to harvest.
- A final leaf spot application at 105 DAP is usually adequate to provide control through harvest at 135 DAP. Check fields at 120 DAP; if leaf spot is present on > 5 % of lower leaves and harvest will be delayed past 135 DAP, apply an additional leaf spot treatment.

Alternative to “Calendar” Spray Programs: An alternative to calendar-scheduled leaf spot sprays is to spray based on the weather. The rules for weather-based leaf spot application are:

1st spray: treat when 5 daily rain events (0.1” or more) have occurred since ground cracking.

Each subsequent spray: wait 10 days since the last application, then treat whenever 2 rains occur after

the 10 day interval.

Arresting a Leaf Spot Epidemic:

Good fungicide programs are designed to prevent leaf spot not try to “cure” it after the fact. But if something goes wrong and you find late leaf spot lesions in the bottom of the peanut canopy, treat immediately with 5-10 fl oz of Topsin 4.5FL + 1.5 pt Bravo. Follow up in 10 days with 1.5 pt Tilt/Bravo or 5 oz Topsin + 1.5 pt Bravo. Our tests have shown that this is the most economical way to arrest an epidemic.

Cylindrocladium Black Rot (CBR) Control:

CBR is caused by a soil fungus which occurs in the same fields from year to year, often in low spots. **Rotation** (at least 2 years out of peanuts and elimination of soybean from the rotation) is the best defense against severe CBR. Once established, CBR must be minimized with **varietal resistance** (Perry, Ga 03L, Ga 02C, Ga 01-R) and in severe cases, fumigation (Vapam 10 gal/ac). **Vapam** must be shanked into a bed at an 8” depth 2 weeks prior to planting. Avoid fumigating when there is a high risk of heavy rain (> 1.0”) within 2 days. Folicur, Abound, and Headline may provide some CBR suppression, but not control. **Provost** is a new fungicide which can provide improved suppression, but not control of CBR.

Calendar Spray Programs:

The following disease control programs are gameplans or guidelines. Timing (DAP = days after planting) should be modified to account for opportunities to wash soil fungicides into the pegging zone if no irrigation is available. Under drought conditions, the grower has to rely on his own judgment of the 5-day weather forecast to decide when to apply a soil fungicide before a rain.

EXAMPLE PEANUT DISEASE CONTROL PROGRAMS

Level 1 Programs: Foliar disease control only.

Grower assumes that field has no economic level of white mold or Rhizoctonia limbrot.

Treatment options at specified days after planting:					
30*	45	60	75	90	105
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt	Headline 6 oz	Bravo 1.5 pt	Headline 6 oz	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt	Bravo 1 pt + Topsin 5 fl oz	Bravo 1.5 pt	Bravo 1 pt + Topsin 5 fl oz	Bravo 1.5 pt
<p>* An optional 30 DAP 1 pt Bravo appl. (usually tank-mixed with Cadre at 30 -35 DAP) is recommended for high leaf spot risk (highly susceptible variety, frequent rain (6 times) since emergence, rotation less than 2 yrs. out of peanut, or for frequent irrigation programs). - If a 30 DAP Bravo appl. is made, then 1.5 pt Bravo can be substituted for Tilt/Bravo at 45 DAP. - Generic alternatives can be substituted for Bravo or Tilt/Bravo (2 oz + 1 pt).</p>					

Level 2 Programs: Foliar disease control and some soil disease suppression.

Grower assumes relatively low levels of white mold or Rhizoctonia limbrot in fields without recent (5 yr.) peanut or soybean history. However, even fields out of legumes for over 10 years can sometimes have high white mold levels. **These programs are particularly applicable to runner varieties under low to moderate white mold pressure.**

Treatment options at specified days after planting:					
30*	45	60	75	90	105
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Folicur 7.2 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1 pt	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Artisan 16 oz + Bravo 1 pt	Artisan 16 oz + Bravo 1 pt	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Moncut 70 1 lb + Bravo 1.5 pt	Bravo 1.5 pt	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Abound 12 oz	Folicur 7.2 oz + Bravo 1 pt or Artisan 16 oz + Bravo 1 pt	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Bravo 1.5 pt	Provost 8 oz	Artisan 16 oz + Bravo 1 pt or Moncut 0.5 lb + 1.5 pt Bravo or Folicur 7.2 oz + Bravo 1 pt	Bravo 1.5 pt
<p>* An optional 30 DAP 1 pt Bravo appl. (usually tank-mixed with Cadre at 30 -35 DAP) is recommended for high leaf spot risk (highly susceptible variety, frequent rain (6 times) since emergence, rotation less than 2 yrs. out of peanut, or for frequent irrigation programs). - If a 30 DAP Bravo appl. is made, then 1.5 pt Bravo can be substituted for Tilt/Bravo at 45 DAP. - Topsin 5 fl oz + Bravo 1 pt can be substituted for Bravo 1.5 pt. Topsin 5 fl oz can also be substituted for Bravo 1 pt in a Folicur tankmix. Never use Topsin alone and no more than 2 appl. per year. - Generic alternatives can be substituted for Bravo, Tilt/Bravo (2 oz + 1 pt), or Folicur.</p>					

Level 3 Programs: Foliar disease control and standard soil disease control.

Grower assumes there is a significant risk of white mold and Rhizoctonia limbrot loss in peanut rotation or soybean rotation within past 5 years.

Treatment options at specified days after planting:					
30*	45	60	75	90	105
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Folicur 7.2 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Artisan 16 oz + Bravo 1 pt or + Headline 6 oz	Folicur 7.2 oz + Bravo 1 pt	Artisan 16 oz + Bravo 1 pt or + Headline 6 oz	Folicur 7.2 oz + Bravo 1 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Artisan 16 oz + Bravo 1 pt or + Headline 6 oz	Artisan 16 oz + Bravo 1 pt	Artisan 16 oz + Bravo 1 pt or + Headline 6 oz	**Artisan 16 oz + Bravo 1 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Abound 12 oz or Headline 12 oz	Folicur 7.2 oz + Bravo 1 pt	Abound 12 oz	Folicur 7.2 oz + Bravo 1 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Moncut 70 1 lb + Bravo 1.5 pt	Bravo 1.5 pt	Moncut 70 1 lb + Bravo 1.5 pt	Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt	Provost 8 - 10.7 oz	Artisan 16 oz + Bravo 1 pt or Moncut 0.5 lb + 1.5 pt Bravo or Folicur 7.2 oz + Bravo 1 pt or Abound 12 oz	Provost 8 - 10.7 oz	**Artisan 16 oz + Bravo 1 pt or **Moncut 0.5 lb + 1.5 pt Bravo or Folicur 7.2 oz + Bravo 1 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Abound 18 oz	Bravo 1.5 pt	Abound 18 oz	Bravo 1.5 pt
*Bravo 1pt	Tilt/Bravo 1.5 pt + Lorsban 15G 13.3 lb band (50-55 DAP)	Headline 6 oz foliar	Bravo 1.5 pt	Artisan 32 oz + Bravo 1 pt or Moncut 70 1 lb + Bravo 1.5 pt or Abound 18 oz	Bravo 1.5 pt

* An optional 30 DAP 1 pt Bravo appl. (usually tank-mixed with Cadre at 30 -35 DAP) is recommended for high leaf spot risk (highly susceptible variety, frequent rain (6 times) since emergence, rotation less than 2 yrs. out of peanut, or for frequent low rate irrigation programs). If a 30 DAP Bravo appl. is made, then 1.5 pt Bravo can be substituted for Tilt/Bravo at 45 DAP.

** Note that Artisan and Moncut have a 40 day preharvest interval.

- Topsin 5 fl oz + Bravo 1 pt can be substituted for Bravo 1.5 pt. Topsin 5 fl oz can also be substituted for Bravo 1 pt in a Folicur tankmix. Never use Topsin alone and no more than 2 appl. per year.

- Generic alternatives can be substituted for Bravo, Tilt/Bravo (2 oz + 1 pt), or Folicur.

Level 4 Programs - White Mold: Foliar disease control and maximum white mold control.

Grower knows that the field has a documented history of severe white mold and economic loss even when treated with standard soil disease programs.

Treatment options at specified days after planting:					
30*	45	60	75	90	105
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Moncut 70 1-1.4 lb + Bravo 1.5	Folicur 7.2 oz + Bravo 1 pt	Moncut 70 1-1.4 lb + Bravo 1.5 pt	Folicur 7.2 oz + Bravo 1.5 pt
*Bravo 1pt	Bravo 1.5 pt or Tilt/Bravo 1.5 pt	Artisan 32 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1 pt	Artisan 32 oz + Bravo 1 pt	Folicur 7.2 oz + Bravo 1.5 pt
*Bravo 1pt	Tilt/Bravo 1.5 pt + Lorsban 15G 13.3 lb band (50-55 DAP)	Headline 6 oz or Bravo 1.5 pt	Folicur 7.2 oz + Bravo 1-1.5 pt	Artisan 32 oz + Bravo 1-1.5 pt	Bravo 1.5 pt or Folicur 7.2 oz + Bravo 1.5 pt
<p>* An optional 30 DAP 1 pt Bravo appl. (usually tank-mixed with Cadre at 30 -35 DAP) is recommended for high leaf spot risk (highly susceptible variety, frequent rain (6 times) since emergence, rotation less than 2 yrs. out of peanut, or for frequent low rate irrigation programs). If a 30 DAP Bravo appl. is made, then 1.5 pt Bravo can be substituted for Tilt/Bravo at 45 DAP.</p> <p>- Generic alternatives can be substituted for Bravo, Tilt/Bravo (2 oz + 1 pt), or Folicur.</p> <p>- <u>Use of Lorsban 15G at 55 DAP will increase worm and spider mite problems in August (particularly on dryland peanuts).</u></p>					

Level 4 Program - CBR: Foliar disease control, maximum white mold control, increased CBR suppression.

Grower knows that the field has a history of significant economic loss from CBR. **Severe CBR requires fumigation with Vapam and varietal resistance;** see guidelines in Peanut Disease Control table on following pages. Foliar Provost treatment can suppress CBR, but will not control it in severely infected fields.

Treatment options at specified days after planting:					
30*	45	60	75	90	105
*Bravo 1pt	Bravo 1.5 pt	Provost 10.7 oz	Provost 10.7 oz + Bravo 1.5 pt	Provost 10.7 oz	Provost 10.7 oz + Bravo 1.5 pt
<p>* An optional 30 DAP 1 pt Bravo appl. (usually tank-mixed with Cadre at 30 -35 DAP) is recommended for high leaf spot risk (highly susceptible variety, frequent rain (6 times) since emergence, rotation less than 2 yrs. out of peanut, or for frequent low rate irrigation programs).</p> <p>Addition of chlorothalonil (Bravo) to at least two of the Provost applications in a “4-block” Provost program is needed to prevent rapid development of leaf spot resistance.</p> <p>- Generic alternatives can be substituted for Bravo.</p>					

A GUIDE TO PEANUT FUNGICIDES

Jay W. Chapin, Extension Specialist

Product	Chemistry	Resistance potential	PHI	Strengths	Limitations
Abound	a strobilurin (azoxystrobin)	high	14	1. Effective preventative against white mold and limbrot; probably the best limbrot material. 2. Systemic activity against both leafspot and web blotch.	1. Not very cost-effective against leafspot, 12 oz rate minimal for leaf spot control. 2. High resistance potential like other strobilurins.
Absolute	a triazole (tebuconazole) + a strobilurin (trifloxystrobin)	high	14	1. Addition of trifloxystrobin (Flint) to tebuconazole (Folicur) improves leaf spot control.	1. 3.5 oz rate may not control Folicur tolerant strains of late leaf spot. 2. Can't use more than 2 total strobilurin appl. per year.
Artisan	Moncut + Tilt (flutolanil + propiconazole)	low	40	1. Excellent against white mold and limbrot). Active against early leaf spot.	1. Will not control late leaf spot. 2. No CBR suppression.
Bravo (and generics)	-a substituted benzene (chlorothalonil)	low	14	1. Relatively low cost control of leaf spot. 2. Multiple modes of action reduce resistance risk.	1. No activity against soil disease. 2. Preventative, contact activity only, no systemic or curative activity against leaf spot. 3. Less effective than systemics against web blotch.
Evito	a strobilurin	high	14	Efficacy currently under evaluation for S. C. conditions.	Efficacy currently under evaluation for S. C. conditions.
Folicur (and generics)	a triazole (tebuconazole)	Leafspot Resistant	14	1. Highly effective against white mold and limbrot; effective white mold "curative".	1. Not effective against web blotch. 2. No longer effective against late leaf spot.
Headline	a strobilurin (pyraclostrobin)	high	14	1. The longest residual and overall best systemic leaf spot fungicide & web blotch. 2. Has activity against white mold and limbrot at 12-15 oz rates.	1. Ounce-for-ounce not as good against white mold as Abound. 2. Like Abound (a strobilurin) this product is prone to development of resistance (use no more than 2 total strobilurin appls. per yr).
Lorsban 15G	chlorpyrifos	low	21	1. Excellent white mold control. 2. Preventative control of soil insects.	1. Causes worm and spider mite outbreaks. 2. Requires granular band appl. 3. Increases Rhizoctonia limbrot.
Moncut	a benzamide (flutolanil)	low	40	1. Highly effective alternative chemistry to triazoles and strobilurins for white mold and limbrot control.	1. No control of foliar diseases, but can be tank-mixed with Bravo (chlorothalonil). 2. No activity against <i>Cylindrocladium</i> black rot (CBR).
Provost	two triazoles (prothioconazole + tebuconazole)	high	14	1. Highly effective against leaf spots. 2. Effective against white mold and limbrot. 3. Improved CBR suppression.	1. Triazoles vulnerable to leaf spot resistance. Must be rotated or tank-mixed with other chemistry.
Stratego	a triazole (Tilt) + a strobilurin (trifloxystrobin)	med.	14	1. Combination of Tilt and Flint (a strobilurin) has good systemic activity against leaf spot.	1. No soil disease activity. 2. Lack of soil disease control "wastes" a strobilurin appl.
Tilt/ Bravo & generics	a triazole (propiconazole) + chlorothalonil	low	14	1. Addition of Tilt to Bravo improves leaf spot control because Tilt is systemic.	1. Tilt has only weak activity against soil diseases and Bravo has none. 2. Tilt alone is ineffective against late leaf spot.
Topsin M	a benzimidazole (thiophanate-methyl)	very high	14	1. Highly effective systemic against late leaf spot when tank-mixed with Bravo.	1. VERY susceptible to resistance so must be tank-mixed and limited to two applications per year.

There is no perfect all-around fungicide. The best programs use a combination of products to maximize profitability and minimize the risk of disease resistance.

PEANUT DISEASE CONTROL

Jay W. Chapin, Extension Specialist

Disease	Product	Rate /acre	Comments
Early Leaf Spot Late Leaf Spot Pepper Spot Web Blotch	chlorothalonil		Chlorothalonil products are preventative only against leafspot and require excellent coverage. Other products listed for leafspot control are locally systemic within the leaf and have some “curative” activity. Alternated chemistry programs are recommended to protect against as many diseases as possible (both foliar and soil diseases); and more importantly, to prevent the development of resistance. See example disease control programs. Topsin should never be used alone because it is highly susceptible to resistance. Folicur alone will not control web blotch or late leaf spot.
	Bravo Weather Stik	1.5 pt	
	Bravo Ultrex	1.36 lb	
	Chemnut 720	1.5 pt	
	Echo 720	1.5 pt	
	Echo 90 DW	1.25 lb	
	Equus 720 SST	1.5 pt	
	Equus DF and others	1.36 lb	
Tilt / Bravo 4.3	1.5 pt		
Tilt + Bravo	2 oz + 1 pt		
PropiMax + Echo	2 oz + 1 pt		
Bravo + Topsin 4.5 FL or Topsin M 70W	1 pt + 5 oz 0.25 lb		
Abound 2.08 F	12-18.5 oz		
Folicur 3.6F (or generics) + Bravo	7.2 oz + 1 pt		
Headline 2.1 lb/gal	6-9 oz		
Provost	7 oz		
White Mold and Rhizoctonia Limb Rot	Abound 2.08 F	12-18.5 oz	Do not use surfactants or crop oil with Abound, Folicur, Headline, or Provost. The goal is to wash white mold fungicides into the soil. Spray before irrigation or rain when possible. Wait 24 hours to irrigate in order to also get maximum leafspot benefits. Under high risk, make sure a fungicide application for white mold (Abound, Folicur, Moncut, Artisan, or Provost) occurs NO LATER THAN 60 DAP. White mold must be <u>prevented</u> ; and hot weather accelerates white mold. Use 0.5-0.7 lb Moncut rates in four appl. programs or 1.0-1.4 lb rates in two appl. programs.
	Folicur 3.6F (also Muscle, Integral, Orius, Tebuzol, etc.)	7.2 oz	
	Headline 2.1 lb/gal	12-15 oz	
	Moncut 70 DF	0.5-1.43 lb	
	Artisan	16 - 32 oz	
	Lorsban 15G (white mold only)	13.3 lb Banded	
Provost	8 - 10.7 oz		
Cylindrocladium Black Rot (CBR)	Vapam (metam sodium 42%)	10 gal	Vapam must be shanked into the soil (8” depth) and bedded at least 14 days prior to planting. Soil temperature at 4” depth should be 60°F. Do not fumigate when rain (1.0” or more) is expected within 48 hrs. Abound, Headline, and Folicur can also provide some suppression of CBR when used as foliar fungicides. Crop rotation is extremely important in reducing the risk of CBR. Resistant varieties (e.g. Perry, Ga 03L, Ga 02C) can also reduce economic injury in CBR infected fields. Delaying planting until the last two weeks of May can suppress CBR by increasing seedling soil temperatures.
	Provost (CBR suppression)	10.7 oz	
Spotted Wilt Virus	--	--	See 6-step control program.

Disease Response Chart For Peanut Fungicides*

Jay W. Chapin, Extension Specialist

Fungicide(s)	Rate	Late Leaf Spot	White Mold	Rhizoctonia Limbrot	CBR (Cylindrocladium)	Web Blotch
¹ Abound	12 oz	Good	Good	Excellent	Poor	Good
² Artisan	16 oz	Poor	Excellent	Very Good	None	Poor
Artisan + Bravo	16 oz + 1 pt	Very Good	Excellent	Very Good	None	Fair
Artisan + Headline	16 oz + 6 oz	Very Good	Excellent	Very Good	None	Good
Bravo (or generics)	1.5 pt	Very Good	None	None	None	Fair
Folicur (or generics)	7.2 oz	Poor - Fair	Very Good	Very Good	Poor - Fair	Fair
Folicur + Bravo	7.2 oz + 1 pt	Very Good	Very Good	Very Good	Poor - Fair	Good?
Folicur + Topsin	7.2 oz + 5 oz	Very Good	Very Good	Very Good	Poor - Fair	Good?
³ Headline	12 oz	Excellent	Fair	Very Good	Poor	Excellent
⁴ Moncut	0.5 lb	None	Excellent	Very Good	None	None
Moncut + Bravo	0.5 lb + 1.5 pt	Very Good	Excellent	Very Good	None	Fair
⁵ Provost	8 – 10.7 oz	Excellent	VG (8 oz) Ex.(10.7 oz)	Very Good – Excellent ?	Fair	Good?
Tilt-Bravo (or generics)	1.5 pt	Very Good	Poor	None	None	Fair
⁶ Topsin 4.5FL	5 - 10 oz	See footnote	None	Fair ?	None	Fair ?

*Ratings are based on the relative performance of the listed application rates. Effective disease control and resistance prevention requires multiple application programs with a combination of materials as outlined in the Production Guide examples. **None** = no control; **Poor** = measurable but low level of control; **Fair** = erratic control or suppression only; **Good** = controls moderate disease pressure; **Excellent** = consistent high level of control.

¹**Abound** at the maximum 18 oz rate is rated excellent on leaf spot and white mold. Never exceed 2 total strobilurin (Abound or Headline) applications per season.

²**Artisan** can be applied up to 32 oz for even greater white mold control, but still must be mixed with Bravo or Headline for leaf spot control.

³**Headline** at a 6 – 9 oz also rated very good to excellent on leaf spot. Never exceed 2 total strobilurin (Abound or Headline) applications per season.

⁴**Moncut** at 1.0 – 1.4 lb rate provides even greater white mold control, but always needs Bravo (1.5 pt) tank-mixed for leaf spot.

⁵**Provost** is excellent against leaf spot at 7-8 oz rate; maximum 10.7 oz rate needed for CBR suppression.

⁶**Topsin** is highly effective against leaf spot as a tank-mix with Bravo or Folicur. Never use Topsin alone and never exceed 2 total Topsin applications per season.

INSECT MANAGEMENT

See the following table for insect control recommendations.

Thrips: Thrips cause serious crop stunting and yield loss from both direct feeding and virus transmission (tomato spotted wilt). All commercial peanuts planted in S. C. should be treated at planting with a preventative in-furrow insecticide (Thimet or Phorate 20G, or Temik 15G. See the following table for Thimet / Phorate rates based on row spacing.

Soil Insects:

Lesser cornstalk borers attack pods, pegs, lateral stems, and the plant crown at the soil line during extended drought stress. Fields with lighter soils are particularly vulnerable. In addition to direct injury, this insect is associated with increased white mold and aflatoxin levels due to wounding of the plant. Rapid canopy closure and reduced soil temperatures reduce LCB risk. **Irrigation is the best defense against lesser cornstalk borer.** Granular Lorsban (13 lb/ac) can be applied at pod set (about 50-55 DAP) to high risk fields (sandy soils under drought stress). At least 1/4" rain is needed within 10 days of application to benefit from Lorsban. Lorsban also reduces pod damage from wireworm, burrower bugs, and southern corn rootworm feeding. Unfortunately, Lorsban causes outbreaks of corn earworm, granulate cutworm and spider mites under drought stress later in the season.

Burrower bugs primarily attack reduced-tillage peanut fields under drought stress. These are underground stink bugs which feed directly on kernels by piercing pods with their needle-like mouthparts. In addition to direct yield and grade loss, burrower bugs are associated with increased aflatoxin levels. **Irrigation is also the best defense against burrower bug injury.**

Wireworms are immature or larval stages of click beetles, and they commonly feed on peanut pods. Although wireworms are capable of causing significant injury, thus far economic damage to peanut has been minimal under S. C. conditions. The only practical treatment for wireworms is preventative Lorsban application.

Southern corn rootworm is the immature stage of the eleven-spotted cucumber beetle. This worm tunnels into peanut pods under high soil moisture conditions, usually in more organic soils such as found in bottom areas of a field. Rootworm injury has been a relatively minor concern thus far under S. C. conditions. Preventative granular Lorsban is the only practical treatment for rootworms.

Foliage Caterpillars:

Corn earworm is the most common foliage feeding insect on peanuts. Corn earworms usually appear in peanut fields during the last week of July or first week of August after the moths emerge from corn fields. Corn earworms initially feed in plant terminals, then blooms, older leaves, and pegs as the worms mature.

Fall armyworms are not usually an economic problem on peanut, but can occur in very high numbers during outbreak years. This insect usually shows up in peanut fields in mid-August, a couple weeks after corn earworms first appear.

Granulate cutworm can defoliate small plants in June and can also be a problem late in August where Lorsban was previously used because Lorsban kills fire ants and other predators. Granulate cutworms have distinctive "sergeant" markings along the back. Granulate cutworms initially feed on blooms, then leaves, pegs, and pods as the worms mature. During the day cutworms can be found

curled up under shed leaves and other organic matter on the soil surface. The larger larvae climb up the plant to feed at night.

Velvetbean caterpillars can defoliate late maturing peanuts rapidly during late September or October in the southern coastal plain counties of S. C, especially in Jasper, Hampton, Allendale, and Colleton counties. Velvetbean caterpillars range from light green to almost black, but the key identification characteristic is that the medium to large worms will thrash violently when handled. They are easy to control.

Scouting for Foliage Caterpillars:

Use a 3' shake cloth to look for worms starting the last week of July, especially on fields treated with Lorsban. Work the dowel handle up under the lateral stems to the plant crown and bend the other side of the plants over the cloth; then beat down vigorously 15 times to knock the worms onto the cloth. Shake the plants, bend them back out of the way, and count the worms on the cloth. Also count the worms under the cloth on both sides of the row to calculate worms per row ft. Check at least three areas of the field.

Rank-growing, unstressed peanuts can tolerate 8 foliage feeding worms per row ft. The treatment threshold is 4 worms per row ft. on stressed plants which have not lapped the middle or where Lorsban has previously been applied. Georgia Green is more susceptible to foliage feeding because this variety has a smaller, slower growing canopy. **Irrigation is the best defense against foliage-feeding worms.**

Spider mites:

Spider mites can damage drought stressed peanuts in August and September. Stressed fields should be spot checked for yellow "hits" which indicate where mites are feeding. Spider mites can be seen with a hand lens on the underside of leaflets. Comite and Danitol are labeled for mite control, but these products require ground application, thorough coverage, and potentially a second application in 5 days. Lorsban application greatly increases the risk of mite outbreaks. **Irrigation is the best defense against spider mite injury.**

PEANUT INSECT CONTROL

Jay W. Chapin, Extension Specialist

Insect	Product	Rate /acre	Comments
Thrips	Temik 15 G	5 lb	Preventative in-furrow thrips control is a must on all peanuts planted in S.C.
	Thimet / Phorate 20G	4.4 lb (38" rows)	The labeled phorate use rate is 5.1 oz/1,000 row ft. which is equivalent to 4.4 lb on 38", 4.65 lb on 36", and 5.6 lb on 30" rows. For twin rows on 38" centers, 3.4 oz/1,000 row ft equals the 5.8 lb/ac maximum labeled rate per ac.
	Orthene 75S Orthene 97	0.5 lb 6 oz	Use foliar Orthene if in-furrow treatments do not prevent stunting.
Leafhoppers	Orthene 75S	1.0 lb	Hopperburn starts on field borders in June - July. Treat if hopperburn is spreading across the field and approaching 15 - 20 % symptomatic leaflets.
	Orthene 97	12 oz	
	Asana XL	3.9 oz	
	Baythroid 2	1.0-1.8 oz	
	Karate Z	1.0 - 1.6 oz	
Three-cornered alfalfa hopper	Asana XL	3.9 - 5.8 oz	Treat at 45-60 days after planting to prevent injury. Ga. Green variety is particularly susceptible to three-cornered alfalfa hopper injury.
	Baythroid 2	1.8-2.4 oz	
	Karate Z	1.3 - 1.9 oz	
	Orthene 75S	0.65 lb	
	Orthene 97	8 oz	
Corn earworm	Asana XL	3.9 - 5.8 oz	Unstressed plants with a large, closed canopy can tolerate 8 worms per row ft. Treat if populations reach 4 per row ft. on drought stressed, unlapped peanuts or on fields previously treated with Lorsban.
	Baythroid 2	1.8-2.4 oz	
	Danitol 2.4 EC	10.6 - 16 oz	
	Karate Z	1.3 - 1.9 oz	
	Lannate 2.4 LV	12 -18 oz	
	Lannate 90 SP	0.25 - 0.38 lb	
Fall armyworm	Danitol 2.4 EC	10.6 - 16 oz	Same threshold as for corn earworm. Fall armyworm attacks peanut in outbreak years from mid-August to early September.
	Karate Z	1.3 - 1.9 oz	
	Steward	9.2 - 11.3 oz	
	Tracer	2.0 - 3.0 oz	
Beet armyworm	Steward	9.2 - 11.3 oz	Same threshold as for corn earworm.
	Tracer	2.0 - 3.0 oz	
Velvetbean caterpillar	Asana XL	3.9 - 5.8 oz	Velvetbean caterpillar is a late season pest (Sept. - Oct.) that can defoliate peanuts quickly. This pest is usually easy to control but often misidentified as an armyworm, leading to unnecessary treatment cost. Karate provides residual VBC control. Adding Dimilin 2L (2 fl oz/ac) to the last fungicide treatment will prevent VBC outbreaks in high risk areas (southern coastal plain counties). However do not use Dimilin to control an established population. Steward will not control velvetbean caterpillar.
	Baythroid 2	1.8-2.4 oz	
	Karate Z	1.3 - 1.9 oz	
	Dimilin 2L	2.0 oz	
Granulate Cutworm	Steward	9.2 - 11.3 oz	Treat if cutworms reach 4 per row ft. on fields previously treated with Lorsban. Or treat if defoliation exceeds 30 % on small plants in June. Granulate cutworms now resistant to pyrethroids.
Spider mites	Comite 6.5 EC	2 pt	Use ground application, 20 gal/ac at 40-60 psi. Prevent mites with irrigation. Lorsban causes mite outbreaks.
	Comite II	2.25 pt	
	Danitol	16 oz	
Lesser cornstalk borer	Lorsban 15 G	13.3 lb	Apply with a 5" bander the first week of July. Lorsban can cause spider mite and worm outbreaks. Rainfall is needed within 10 days of application. Lorsban also provides significant white mold control, but triggers outbreaks of worms and spider mites.
Burrower bug	Lorsban 15 G	13.3 lb	See comment above.
Southern corn rootworm and Wireworms	Lorsban 15 G	13.3 lb	Lorsban 15G can be applied from planting until the first week of July for rootworm or wireworm suppression. Use Lorsban 4E at-planting only.
	Lorsban 4E	2 qt	

The label is the law. Always read and follow all pesticide label restrictions.

Peanut Insecticide Use Precautions

Active Ingredient	Brand Name	Pre-Harvest (Days)	Comments
acephate	Orthene 75S Orthene 97	14	Do not feed or graze.
aldicarb	Temik 15G	90	Apply in-furrow.
beta-cyfluthrin	Baythroid 2	14	Do not exceed 0.066 ai per ac per season.
chlorpyrifos	Lorsban 15G	21	Do not exceed 26.6 lb 15G /ac per crop year.
diflubenzuron	Dimilin 2L	28	Do not exceed 3 appl. per season.
esfenvalerate	Asana XL	21	Do not feed or graze.
fenthoathrin	Danitol 2.4 EC	14	Do not feed forage or hay within 14 days of treatment. Do not exceed 2.66 pt/ac per season.
gamma cyhalothrin	Prolex 1.25	14	Do not exceed 0.38 pt/ac per season.
indoxycarb	Steward 1.25 SC	14	Do not exceed 45 fl oz/ac per season.
lambda-cyhalothrin	Karate Z 2.08	14	Do not feed or graze.
methomyl	Lannate 2.4 LV Lannate 90 SP	21	Do not feed treated vines.
propargite	Comite 6.5 EC	14	Do not exceed 1 appl. per season.
phorate	Thimet 20G	90	Do not apply more than 5.8 lb per ac. Do not feed or graze hay.
spinosad	Tracer	3	Do not exceed 9 fl oz/ac per season.
The label is the law. Always read and follow all pesticide label restrictions.			

DETERMINING HARVEST MATURITY

Determining when to dig is highly important because peanut maturity determines grade and yield. Over-mature peanuts can quickly lose peg strength, resulting in significant yield loss. There are many practical considerations which effect digging date such as vine health, weather forecast, total acreage, and combine capacity. A sound disease management program in the critical 60-105 DAP interval provides the vine health needed later in the season to leave the crop in the ground to build grade, weight, and crop value. Late season storms may also require leaving the crop in the ground longer than planned. If a large acreage is planted late, some fields may have to be dug before reaching maximum grade to reduce overall risk. It is seldom practical to dig every field at optimum maturity, but there are some useful guidelines to determine when to start digging, and which fields are most mature.

Days After Planting: Days after planting (DAP) should never be used as the sole basis for determining digging date, but it is a good guideline for when to check fields, and can be used in combination with other methods. Peanuts can reach harvest maturity from 120-150 days in S. C. depending on variety and growing season, but 130-140 days is typical for medium maturity varieties, with virginia types on the short end and runners on the long end of this interval. Never dig at less than 130 DAP without verifying maturity by checking pod color. Once peanuts reach 150 DAP (140 days for virginia types), the risk of declining peg strength on over-mature pods goes up significantly. Over-mature pods have a coal-black mesocarp, a tan-brown seed coat, and may have visible deterioration of the peg.

Hull Color Method: Pod maturity can be determined by scraping away the outer hull layer with a pocket knife or blasting with a pressure washer to reveal the color of the middle layer or mesocarp. As peanuts mature the mesocarp color changes from white to yellow, orange, brown, and then black. Kernels in pods with an orange mesocarp color, and even most kernels in late-yellow stage pods are mature enough to ride the grade screen (sound mature kernels). Although these yellow and orange pods produce sound mature kernels, they will continue to increase both yield and grade by adding weight as they mature.

Pull up a clump of 2-3 three plants from a representative area of the field, and remove all full-size pods (100-200). Be sure to remove all full-size pods rather than selecting just the most mature. Scrape the upper surface or “saddle” of each pod and place in one of four piles corresponding to color (white, yellow, orange, brown / black).

Or use a **pressure washer** to blast the outer layer off the pod sample. Put the pods in a 12” diameter wire basket made of ¼” hardware cloth. A small electric pressure washer with 1,300 – 1,600 psi is adequate, but make sure it has an oscillating or “turbo” type nozzle.

Count the pods in each pile and determine the percentage for each color pile. For virginia types, the maturity target is to have 70% of pods in the orange, brown, and black categories combined, and 30% of pods in the brown and black categories combined. For runners the target is to have 70-75% in orange + brown + black categories, and 40% in brown + black categories. to attain a 70 grade (total sound mature kernels). It takes 10-14 days for pods to move from the midpoint of one color category to another. The brown-black category will increase by about 1 % per day.

RELATIONSHIP BETWEEN PLANT AGE AND HARVEST MATURITY

Days after planting	Pod Mesocarp Color Categories	Maturity Comments
120	Late yellow and orange color categories have the most pods.	Check fields by hull color method to see which will mature first.
130	Orange to brown mesocarp color categories have the most pods.	130 DAP is considered an early digging date for medium maturity runner varieties under typical weather conditions, but medium maturity virginia types can mature in 132-135 days. Mature peanuts should have grades of at least 70% TSMK under adequate rainfall conditions.
140	Brown / black mesocarp color category has the most pods.	Medium maturity runners mature; virginia types can rapidly become over-mature. Grade should be excellent (at least 72 TSMK) assuming normal rainfall.
150	Over 40 % of harvestable pods in brown / black category. Seed coat turns tan-brown on over-mature pods and some pegs may be deteriorated.	Deteriorating peg strength on over-mature pods can cause significant loss, particularly on virginia types.

NEVER RELY ON PLANT AGE ALONE TO DETERMINE DIGGING DATE. THIS IS ONLY AN EXAMPLE UNDER TYPICAL GROWING CONDITIONS; MANY FACTORS CAN INFLUENCE ACTUAL MATURITY.

Maturity board: Pods are collected and scraped or blasted as described for the above 4-pile method to reveal mesocarp color. The pods are then laid out on a color chart to predict days to maturity.

Shell Out Method: This is a traditional method used for virginia type peanuts. Pods are twisted or snapped open to check for internal hull color. When 65% of pods have some darkening on the inside of the hull and veins apparent on the seed coat, the sample is considered mature.

Digger Operation: More yield is lost from improper digging date decisions and digger operation than any other aspect of peanut production. The digger has to stay centered on the row. Check taproot length on inverted peanuts to see that pods are not sheared off from running too shallow.

Also check the inverted row for “stars” on the end of pegs which indicate excessive pod loss. These stars are formed from pieces of the hull when the peg breaks at the point of pod attachment. When pegs break at the pod attachment point, it indicates a physical problem such as dull blades, improper angle, hard ground, or shaker speed not matching ground speed. If pegs break in the middle instead of at the point of pod attachment, there will be no “stars” on the ends of the pegs and the pods will still have a short length of peg attached. This condition indicates that pod loss is being caused either by disease or over-maturity.

Digger ground speed should match pto speed such that the vines flow smoothly up over the digger. Losing one pod per row ft. equals about 40 lb per acre yield loss on runners, or 60 lb per acre loss on large virginia types. Combine setup is critical to maintaining grade. Try to avoid having peanuts weather after digging since wetting and drying causes loose shelled kernels (LSK). LSKs are correlated with afatoxin contamination. Prolonged wetting after inversion can also cause mold and sprout problems.

AVOIDING COLD INJURY

In S. C. we have enough of a peanut growing season to minimize the risk of cold injury in most years. However, having a significant acreage planted late (after 25 May) and drought stress during pod fill are factors that increase the risk of cold damage.

A peanut planted on 26 May will reach 140 DAP on the 13th of October. It's not a problem to have some peanuts planted the last week of May and even a few in early June. We typically still have excellent combining conditions in mid-October. The problem comes when a lot of acres are planted late and need to be combined in mid to late October. Any glitch in the weather gets us behind and pushes combining toward 1 Nov. when cold injury risk climbs every day.

A mid season drought also delays harvest if we have enough rain in August to set a late crop of pods that we have to wait on.

Peanuts are usually most susceptible to frost the day they are dug because the kernel moisture content is high. Kernels with freeze injury are included in the "damaged kernel" category and like anything that contributes to damaged kernels, can potentially cause catastrophic loss. **When total damaged kernels reach 2.5 %, the peanuts are assigned to segregation 2 (the oil market) and can be sold for as low as 35 % of loan (\$125/ton) if they can't be cleaned below 2.5 % total damage.**

Fortunately, when we get a predicted frost risk in late Oct. to early Nov. in the S. C. coastal plain, it is usually a one or two day event followed by warmer weather. So it makes sense to watch the forecast and plan on interrupting digging for a day or two until the front moves through if a hard frost is predicted. Peanuts which have dried for three days have relatively low frost injury risk.

Predicting ground level frost is tricky since forecast lows are based on temperatures about 5 ft above ground height. The actual temperature on dug peanuts is kept warmer by heat radiating from the soil. Local terrain and air drainage complicates the issue, because low pockets in fields are sinks for cold air and may frost.

The bottom line is that with lows predicted at 38 F we keep digging, at 34 F predicted we wait a day for sure, and in between at 35 – 37 F you have to decide how much faith you have in the weatherman not being off target in your field.

What about frost damage to the foliage of peanuts still in the ground? Peanuts in the ground are safe. A light frost will cause some terminal browning that the plant can tolerate. Even if a hard frost in November kills 50% of the leaves or more, the peanuts will hold on the plant for a week until more favorable harvest weather arrives.

After the frost moves through we can go back at it. Don't count on severely frost-singed peanut vines maturing more, but don't feel like they have to be dug the day after frost hits the leaves either. We have seen runners with 50 % of the leaves burned green back up with new foliage. Just get to them as soon as you have good digging conditions. In November we run out of growing season for a peanut anyway since there is little progress during any part of the day below 60 F.

In summary, whatever you do, don't dig right before a potential hard frost is forecast.

PEANUT GRADING - DEFINITIONS AND ECONOMIC SIGNIFICANCE OF TERMINOLOGY

The following definitions are intended to assist growers in understanding the economic significance of peanut grading terminology. A simplified description of the grading process is used which does not include all aspects of USDA approved peanut grading procedures.

Farmers' Stock Peanuts: The peanuts the grower brings to the buying point.

Foreign Material (FM): Everything other than loose peanut kernels and in-shell peanuts in the farmers' stock sample. Foreign material includes dirt, peanut vines, sticks, stones, insect parts, peanut hulls, and "raisins" or "twisters". Raisins or twisters are very immature, shriveled pods which can not be commercially shelled.

Foreign material is the first component to be separated from the grade sample of farmers' stock peanuts. There is no penalty for foreign material up to 4%. At 5% FM there is a 0.05 cents/lb (\$ 1 /ton) penalty which increases with additional % FM. At 10 % FM, the penalty is 0.3 cents/lb (\$ 6/ton or \$12/ac for 2-ton peanuts). Foreign matter penalties may vary at different buying points. For example some charge no penalty up to 7 %, but then impose a \$10/ton cleaning fee.

LSK (loose shelled kernels): Kernels and parts of kernels which are free from the hull in a load of farmers' stock peanuts.

LSKs are the second component separated out in grading. **LSKs are undesirable** because they spoil more rapidly and are **more likely to be contaminated with aflatoxin**. LSKs are checked for Aspergillus mold by the grader.

LSKs are worth only \$ 0.07/lb (\$ 140/ton) vs. \$0.18/lb (\$360/ton) for an "average" 72 % TSMK load. So **each percent LSK results in a \$ 2.20/ton loss (\$4.40/ac for 2-ton peanuts)**.

At this point the grade sample has had the foreign material and LSKs removed. The remaining intact pods are then run down a set of sizing rollers to presize them for proper shelling and to determine the percent "fancy pods" for virginia types.

Fancy Pods: The percentage of fancy (larger) pods is determined (virginia types only) by the percentage which rides a 34/64" roller spacing. **The grower is not rewarded for fancy pods** other than that they must meet the 40% fancy pod minimum to qualify for the virginia type market.

At this point the sample is shelled and the kernels will be mechanically shaken on screens.

ELK (extra large kernels): An ELK screen is **used only for virginia types**. ELK is the percentage by weight of kernels from the shelled sample that rides a 21.5/64 x 1" screen. There is a premium of 0.0175 cents/lb (36 cents/ton) for each percent ELK. A 40 % ELK has a premium value of \$ 14.40/ton (about \$ 29/ac for 2-ton peanuts). Let's say you grow an NC-V11 with a 38 % ELK vs. a Gregory with a 48% ELK, the **10% ELK difference would be worth \$3.60/ton or only about \$7.20/ac** for assuming the extra risk of growing a large-pod variety.

SMK (sound mature kernels): The percentage by weight of kernels from the shelled sample that rides a 15/64 x 1" (virginia type) or 16/64 x 3/4" (Runner type) screen.

Each percent increase in SMK increases peanut value by about \$5.00/ton. See TSMK below.

SS (sound splits): The percentage by weight of kernels from the shelled sample that consists of undamaged split kernels or broken kernels (undamaged 1/4 to 3/4 kernel pieces; pieces less than 1/4 kernel remain in OK (other kernel category); pieces larger than 3/4 kernel are considered SMKs.

There is no sound split penalty up to 4 % and for each percent above 4, the penalty is only 80 cents per ton.

TSMK (total sound mature kernels): TSMK is the total of SMK (sound mature kernels) + SS (sound splits). ELKs (extra large kernels) are also included in TSMK for Virginia types.

This is the number that counts. Each percent increase in TSMK is worth about 0.25 cents/lb (\$4.96/ton), or about \$ 10.00/ac for 2-ton peanuts. So a 1 point increase in TSMK is worth more than a 10 point increase in ELK. Higher TSMK also correlates with higher yield.

OK (other kernels): The percentage by weight of kernels from the shelled sample that falls through the SMK screen. Other kernels are mostly smaller, less mature kernels. Pieces of broken kernels less than 1/4 kernel size are also included in other kernels.

Other kernels are worth less than sound mature kernels. When you look at a grade sheet this might not be clear because as the percent OKs increases from left to right on the price sheet, the sample value increases by about 0.07 cents/lb (\$1.40/ton) for each point increase. So it might look like higher OK values are good news, but compare that 0.07 cent/lb increase to the 0.25 cent/lb (\$4.96/ton) value of a 1 point increase in TSMK (read up the chart). Immature kernels (OKs) are worth something, but mature kernels (SMKs) are worth more.

DK (damaged kernels): The percentage by weight of kernels from the shelled sample that are judged to be inedible due to decay, mold, insect damage, sprouting (>1/8"), discoloration or pitting darker than light yellow, freeze damaged, or skin-discoloration (<25%).

Although graders do have picture and definition guidelines, **the determination of damaged kernels is somewhat subjective.** Minor pitting, discoloration, or other damage to the kernel skin or flesh does not constitute a damaged kernel. Notice that broken kernels are also not included in damaged kernels; instead they are classified as sound splits and thus contribute to TSMK.

Damaged kernels are the major component of total damage penalties - see below.

Freeze Damage: The percentage by weight of kernels from the shelled sample that have characteristics of freeze damage such as hard, translucent, or discolored flesh. This damage is included in damaged kernels (DK) and thus contributes to total damage.

Concealed Damage - RMD:

Concealed damage - rancid, moldy, or decayed, is damage detected after the kernel sample is put through a kernel splitter and examined on a belt. This damage is added to damaged kernels (DK) to determine total damage.

Total Damage: The sum of damaged kernels (DK), including freeze damage and concealed RMD.

Once total damaged kernels reach 2.5% by weight, the penalty can be catastrophic. At damage levels slightly above 2.5%, the peanuts can sometimes be cleaned (~\$10/ton cleaning fee). If they can't be cleaned below 2.5 % damage the load is classified as segregation II and is consigned to the oil market, with a potential value as low as \$125 per ton (35 % of loan value).

Hulls: The percentage by weight of hulls from the shelled sample. Although no grade premiums or penalties are based on hull weight, the lower the percentage hull weight, the higher the grade. Hull weights in the lower twenties indicate excellent grades because they indicate that the total kernel weight is in the high seventies.

Aspergillus flavus mold: This mold is capable of producing aflatoxin. Only three grade components are examined for the presence of A. flavus mold (LSKs, OKs, and DKs) because these components have the greatest risk. The grader indicates on the grade sheet that A. flavus either was or was not detected.

Detection of A. flavus is bad news. Detection results in the lot being cleaned (~\$ 10/ton cleaning fee) and re-examined. If the contamination is not adequately removed by cleaning, the **peanuts are consigned to segregation III for the oil market, with a potential value as low as \$ 125/ton (35 % of loan value).**

PEANUT GRADING TERMS

Grading Term	Definition	Penalty or Reward
FM Foreign material	Everything but in-shell peanuts and loose kernels.	No penalty up to 4 %. At 5 % lose \$ 1/ton and increases with each %. FM not usually a problem even in strip-till.
LSK Loose shelled kernels	Kernels free from the hull.	With each percent LSK you lose \$2.20/ton. More importantly, LSKs associated with & checked for aflatoxin.
Fancy pods	Pods big enough to ride a 34/64" roller spacing.	No reward or penalty. Only varieties with 40% fancy pods qualify as virginia types
ELK Extra large kernels	Kernels big enough to ride a 21.5/64 x 1" screen (virginia types only).	Premium of \$ 0.36/ton for each percent ELK. So a 40 % ELK has a \$ 14.40/ton premium. A variety with 10 % higher ELK worth only \$ 3.60/ton more.
SMK Sound mature kernels	Kernels mature enough to ride a screen standard: 15/64 x 1" (virginia type) or 16/64 x 3/4" (runner type).	Each percent SMK increases value by about \$ 5.00/ton (see TSMK below).
SS Sound splits	Undamaged split kernels in the shelled sample.	No penalty up to 4 %; \$ 0.80/ton penalty for each percent above 4 %.
TSMK Total sound mature kernels	ELKs + SMKs + SSs (only virginia types are graded for ELKs)	This is the important number. Each percent TSMK increases value by about \$ 5.00/ton. So a 1% increase in TSMK is worth more than a 10 % increase in ELK.
OK Other kernels	Smaller, immature kernels that fall through the SMK screen standard.	Each percent increase in other kernels detracts from the sound mature kernels.
DK Damaged kernels	Kernels judged to be inedible due to mold, insect damage, sprouting, or freeze injury.	At or above 2.5 % the penalty is severe because if the load can't be cleaned (\$10/ton cleaning fee) it is considered segregation II with an oil market value as low as \$ 125/ton (35% of loan).
FD Freeze damage	Freeze damage is included in damaged kernels.	Same as DK penalty above.
Concealed RMD Concealed damage - rancid, moldy, decayed.	Damage detected after kernels in the grade sample are split in half.	Same as DK penalty above.
TD Total damage	The total of damaged kernels, freeze damage, and concealed damage.	Same as DK penalty above.
Aflatoxin	A toxin produced by <i>Aspergillus flavus</i> and related molds.	If the load can't be cleaned, it goes into segregation III - the oil market (as low as \$ 125/ton). LSKs, DKs, and OKs are checked for <i>Aspergillus</i> .

PEANUT PRODUCERS' TOP TEN LIST

Preplant

1. Field Selection / Rotation:

Peanuts require well-drained land and do best on soils with a sandy surface. Avoid fields with recent soybean history as best you can and eliminate soybeans from the rotation in the future. Sustainable peanut production requires a minimum of 2 years (3 years better) of cotton or corn (no legumes) in between peanut crops.

2. Soil test:

Use the **Peanut Fertility Check List** (see S. C. Peanut Production Guide) to compare soil test values to sufficiency levels for all nutrients. **Zinc can severely stunt or kill peanuts.** Raise pH to reduce toxicity risk in high Zn fields. Soil calcium levels of 600 lb/ac and Ca to K ratio of 3:1 or higher are desirable. Small runner varieties don't require gypsum if soil test Ca is above 600 lb. Raise soil Ca with lime if pH allows.

At-Plant

3. Get them inoculated:

Use only liquid in-furrow inoculants; they have been most consistent and are less likely to stop-up. Inoculants are live bacteria; handle with care to keep them alive. Make sure a steady stream (no pulse pumps) hits the center of the open furrow and gets into moisture. Use 5 gal minimum.

Do not use chlorinated water. Don't plant too shallow (less than 1.5"). Always plant into moisture; dry soil kills inoculant and causes erratic emergence, which increases virus problems. Peanuts can be planted up to 3" deep if necessary for good moisture.

4. Reduce tomato spotted wilt virus risk:

- Plant tolerant varieties to the extent possible. NC V11 and Gregory have some virus tolerance. Ga. Green resistance to tomato spotted wilt appears to be declining. Avoid April planting. The first week of May still has increased virus risk, but we need to get started planting large acreages. The optimum planting interval for S. C. is 5-25 May.
- Get a consistent, uniformly emerged stand, target is 4 plants/row ft. (need 6 seed/ft., or at least 5/ft. on large-seeded Va. types).
- Control thrips with in-furrow Thimet (Phorate) 4.4 lb (38" rows) or Temik 5 lb.
- Strip tillage reduces tomato spotted wilt.

0-45 DAP

5. Establish and maintain weed control (first 45 days critical):

- Valor (2-3 oz) is recommended for severe pigweed pressure. Valor must be applied within 2 days of planting; preferably watered in. Prowl/Sonolan or Dual can be tank-mixed. Do not plant shallower than 1.5" to reduce Valor injury.
- The first flush of weeds may need Gramoxone (+ Basagran or Storm) treatment before Cadre application (30-35 DAP). Dual can be applied post-emergence with Gramoxone instead of (or in addition to) PPI for extended pigweed control.
- Use 2,4-DB; Blazer, or Storm where needed for escapes. Poast Plus or Select for grass.

Bloom

6. Give them calcium:

- All virginia type peanuts should get 300 lb/ac Ca (1500 lb landplaster) at blooming.
- Calcium must be available in the pegging zone when the first pods begin to form.
- Better early than late with land plaster!

45 DAP

7. Prevent foliar and soil disease:

Although peanuts on “new” land should be relatively free of diseases, severe leaf spot and white mold loss can still occur. White mold and CBR particularly occur in fields with a soybean history. Peanuts have to be protected from a complex of both soil and foliar diseases with a preventative program. **Start leaf spot treatment no later than 45 DAP** and white mold treatment at 60 DAP. On high risk varieties (Gregory, Phillips, Perry, Brantley) start leaf spot program at 30 DAP. See the Production Guide for example fungicide programs.

60 DAP

8. Irrigation management:

- Peanut is an indeterminate, drought-tolerant crop, but irrigation can be critical to maximize returns from calcium, activate herbicides, and move fungicides into the soil.
- Irrigation also reduces insect damage and **most importantly, prevents aflatoxin**.
- The critical water use period is during pod fill, approximately 60-110 DAP when peanuts need 1.5” per week minus rain. See the Peanut Production Guide for irrigation scheduling.

25 July - 30 August

9. Check for worms:

- Cutworms occasionally defoliate peanuts in late June or early July.
- Corn earworms, followed by fall armyworms, feed on peanut primarily from the last week of July through August. Velvetbean caterpillars sometimes strip peanuts in the lower part of the state in late (Sept. - Oct.). Fully lapped, unstressed peanuts can tolerate up to 8 worms/ft. The threshold is 4 worms per ft. on unlapped or stressed peanuts.
- There are some significant soil pests (lesser cornstalk borer, wireworm, burrower bug, rootworm), but the greatest threats (borers & burrower bugs) can be managed with irrigation.

130 DAP

10. MORE MONEY IS MADE OR LOST WITH DIGGING DECISIONS THAN ANY OTHER ASPECT OF PEANUT PRODUCTION:

Timing: Medium maturity virginia types generally reach harvest maturity in about 130-135 DAP under typical S. C. growing conditions. But many practical considerations figure into when the first field is dug, to include: vine health, acreage, equipment availability, when you started planting, and weather predictions. Runner types are more forgiving and can be allowed to stay in the ground longer, sometimes over 150 days. Start spot checking maturity at about 120 DAP. Use the pod blast or hull scrape method (see this and other techniques in the Peanut Production Guide) to sort pods into color piles and determine which fields should be dug first. Some pod color guidelines for virginia type maturity: 70% of pods in orange + brown + black categories, and 30% in brown + black. For runners: 70-75% in orange + brown + black, and 40% in brown + black. The grade target is at least 70 % TSMK. Practical considerations sometimes prevent waiting on full maturity in every field, particularly for the first field to be dug. **If you are digging before 130 DAP, use pod color to make sure you’re not early; if you are waiting after 140 DAP, make sure you’re not late.**

Digger operation: It is easy to ruin a great crop with the digger. **Staying on the row** with the digger is a must (see growth regulator recommendations in Production Guide). Matching digger ground speed to shaker speed, digger running depth, and soil conditions are also critical.

PEANUT MANAGEMENT CALENDAR

BEFORE PLANTING			
January	Soil test: Compare soil test values to sufficiency levels for all nutrients in Peanut Fertility Table.		
February	Take advantage of invited, out-of-state speakers on peanut production and marketing (State Peanut Grower Meeting). Attend county production meeting for update on product test results. Plan land preparation for conventional tillage.		
March	Early decisions on variety selection may increase the odds of getting the variety you want.		
April	30 days pre-plant, burn down weeds or cover crop for strip-tillage.		
Late April - May	For conventional tillage and non-irrigated, can pre-plant incorporate Prowl or Sonolan. If Vapam fumigation is needed for CBR control, it should go out at least 14 days pre-plant when there is good soil moisture, but minimal risk of rain within 2 days of application.		
PLANTING TO DIGGING			
Approx. Days After Planting	Date: Assumes <u>15 May Planting Example</u>	Growth Stage	Management Steps
0	15 May example planting date	Planted	<ul style="list-style-type: none"> - Plant 5-6 seeds/row ft into good moisture at 1.5” depth (max. 3” if necessary). - Inoculate all new fields and fields out of peanuts for 3 years with liquid in-furrow inoculant. Hit the center of furrow! - Use in-furrow Temik 5 lb or Thimet (Phorate) 4.4 lb for thrips. - Spread planting dates of large acreage over 2 week interval to spread harvest maturity. - Optimal planting interval about 5 – 25 May.
0-2	15-17 May	---	<ul style="list-style-type: none"> - If Valor is used, it must be applied at planting or within 2 days of planting. Prowl/Sonolan or Dual can be tank-mixed.
7	22 May	Cracking - Emergence	<ul style="list-style-type: none"> - A pegging zone (4” depth) soil test can be used to re-evaluate landplaster needs on runner types.
7-28	22 May – 12 June	Seedling	<ul style="list-style-type: none"> - Apply Gramoxone (+ Basagran or Storm) when needed to control first weed flush from cracking through seedling stage. - If thrips injury / stunting occurs after emergence a foliar Orthene treatment is recommended.
35	19 June	Bloom (R1)	<ul style="list-style-type: none"> - Land plaster applied at bloom 35-40 DAP. (be early not late!) - Typical Cadre appl. timing is about 35 DAP. Tank mix 1 pt Bravo with Cadre at 30-35 DAP. - If 2 Gramoxone applications are used instead of Cadre, the second application must be made within 28 days after cracking (about 35 DAP).
45	29 June	Peg (R2)	<ul style="list-style-type: none"> - Apply a leaf spot appl. (Tilt / Bravo) no later than 45 DAP. - Boron can be tank-mixed with the first fungicide if indicated by soil test and not applied previously. - Water is needed to move gypsum into the pegging zone and sustain pod development. - Check to see that the taproot has active nodules if inoculation problems are suspected (yellow plants). - Cutworms can defoliate in late June – early July.

Days After Plant.	Date (if planted 15 May)	Growth Stage	Management Comments
50	4 July	Swollen Peg (R3)	<ul style="list-style-type: none"> - Check for weed escapes; use 2,4-DB or other post-emergence materials where needed. It usually takes a minimum of 60 DAP to close the canopy. - If Lorsban 15G is used to prevent soil insects, it should be applied during pegging (about the first week of July).
60	14 July	Full Size Pod / Begin pod-fill (R4-R5)	<ul style="list-style-type: none"> - Soil disease (white mold) control should begin at 60 DAP or by 15 July. - Mn can be tank-mixed with the 60 DAP fungicide appl. if required by soil test. - If Blazer is used, it should be applied 75 days preharvest, which is about 60 DAP. - Spot spray escaped grasses where necessary with Select or Poast Plus. - Most critical water use period begins; apply 1.5"/week minus rain 60-110 DAP. - Apogee growth regulator timing is 50 % vines touching for 1st appl. and 2nd appl at 100 % row closure.
75	29 July	Pod-fill Full-size seed in oldest pods (R6)	<ul style="list-style-type: none"> - Third fungicide appl. in a 5-spray program is at ~ 75 DAP. - Peak water usage period is around 75 DAP. - Check weekly for corn earworm and fall armyworm starting around 1 Aug. through first week of September. - Spot check fields weekly for leaf spot and white mold from 60 DAP until 2 weeks prior to harvest.
90	13 Aug.	Pod-fill Full Size Seed (R6)	<ul style="list-style-type: none"> - Fourth fungicide appl. is at ~ 90 DAP. - Under severe drought stress watch for spider mite hits in late August to September, particularly where Lorsban has been used.
100	23 Aug.	Early Maturity Oldest pods show internal hull color (R7)	<ul style="list-style-type: none"> - Final fungicide application typically goes on about 105 DAP. But fields should be spot checked at 120-125 DAP for leafspot control.
120	12 Sept.	Early Maturity (R7)	<ul style="list-style-type: none"> - Begin checking fields for maturity to plan digging dates. Use the hull scrape method to determine the percentage in white, yellow, orange, and brown-black hull color categories. - At 125 DAP determine which fields will be the last ones dug and decide if leaf spot control is adequate. If projected harvest is 3 weeks away and 5% of lower leaves have late leafspot lesions, treat immediately. - 110-125 DAP irrigate .75-1.0"/wk as needed to prevent wilting. - Have digger and combine ready to go.
130-140	27 Sept.	Harvest Maturity (R8)	<ul style="list-style-type: none"> - Never dig strictly based on DAP. Variety, seasonal temp. and rainfall determine maturity. Use hull color guidelines to verify harvest maturity. Disease control earlier in the season is critical to maintain the peg strength to carry peanuts to full maturity and provide a margin of safety if weather prevents timely digging. - In October check for velvetbean caterpillar defoliation on the latest maturing fields.
150	12 Oct.	Over-mature (R9)	<ul style="list-style-type: none"> - Even on healthy plants, by 150 DAP there is a very high risk of pod loss from deteriorating peg strength on over-mature virginia type pods .

PEANUT MATURITY CALENDAR

Date of Indicated Days After Planting:

Planting Date	Bloom ing.	First Pegs.	Critical pod-fill, water use, and white mold control period about 60-110 DAP.				Hull scrape to est. time to harvest.		*Typical maturity range for medium maturity varieties.				*Increasing risk of over-maturity and pod loss.		
	35	45	60	75	90	105	120	125	130	135	140	145	150	155	160
May 1	6-5	6-15	6-30	7-15	7-30	8-14	8-29	9-3	9-8	9-13	9-18	9-23	9-28	10-3	10-8
2	6-6	6-16	7-1	7-16	7-31	8-15	8-30	9-4	9-9	9-14	9-19	9-24	9-29	10-4	10-9
3	6-7	6-17	7-2	7-17	8-1	8-16	8-31	9-5	9-10	9-15	9-20	9-25	9-30	10-5	10-10
4	6-8	6-18	7-3	7-18	8-2	8-17	9-1	9-6	9-11	9-16	9-21	9-26	10-1	10-6	10-11
5	6-9	6-19	7-4	7-19	8-3	8-18	9-2	9-7	9-12	9-17	9-22	9-27	10-2	10-7	10-12
6	6-10	6-20	7-5	7-20	8-4	8-19	9-3	9-8	9-13	9-18	9-23	9-28	10-3	10-8	10-13
7	6-11	6-21	7-6	7-21	8-5	8-20	9-4	9-9	9-14	9-19	9-24	9-29	10-4	10-9	10-14
8	6-12	6-22	7-7	7-22	8-6	8-21	9-5	9-10	9-15	9-20	9-25	9-30	10-5	10-10	10-15
9	6-13	6-23	7-8	7-23	8-7	8-22	9-6	9-11	9-16	9-21	9-26	10-1	10-6	10-11	10-16
10	6-14	6-24	7-9	7-24	8-8	8-23	9-7	9-12	9-17	9-22	9-27	10-2	10-7	10-12	10-17
11	6-15	6-25	7-10	7-25	8-9	8-24	9-8	9-13	9-18	9-23	9-28	10-3	10-8	10-13	10-18
12	6-16	6-26	7-11	7-26	8-10	8-25	9-9	9-14	9-19	9-24	9-29	10-4	10-9	10-14	10-19
13	6-17	6-27	7-12	7-27	8-11	8-26	9-10	9-15	9-20	9-25	9-30	10-5	10-10	10-15	10-20
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17	6-21	7-1	7-16	7-31	8-15	8-30	9-14	9-19	9-24	9-29	10-4	10-9	10-14	10-19	10-24
18	6-22	7-2	7-17	8-1	8-16	8-31	9-15	9-20	9-25	9-30	10-5	10-10	10-15	10-20	10-25
19	6-23	7-3	7-18	8-2	8-17	9-1	9-16	9-21	9-26	10-1	10-6	10-11	10-16	10-21	10-26
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23	6-27	7-7	7-22	8-6	8-21	9-5	9-20	9-25	9-30	10-5	10-10	10-15	10-20	10-25	10-30
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30	7-4	7-14	7-29	8-13	8-28	9-12	9-27	10-2	10-7	10-12	10-17	10-22	10-27	11-1	11-6
31	7-5	7-15	7-30	8-14	8-29	9-13	9-28	10-3	10-8	10-13	10-18	10-23	10-28	11-2	11-7
June 1	7-6	7-16	7-31	8-15	8-30	9-14	9-29	10-4	10-9	10-14	10-19	10-24	10-29	11-3	11-8
2	7-7	7-17	8-1	8-16	8-31	9-15	9-30	10-5	10-10	10-15	10-20	10-25	10-30	11-4	11-9
3	7-8	7-18	8-2	8-17	9-1	9-16	10-1	10-6	10-11	10-16	10-21	10-26	10-31	11-5	11-10
4	7-9	7-19	8-3	8-18	9-2	9-17	10-2	10-7	10-12	10-17	10-22	10-27	11-1	11-6	11-11
5	7-10	7-20	8-4	8-19	9-3	9-18	10-3	10-8	10-13	10-18	10-23	10-28	11-2	11-7	11-12
6	7-11	7-21	8-5	8-20	9-4	9-19	10-4	10-9	10-14	10-19	10-24	10-29	11-3	11-8	11-13
7	7-12	7-22	8-6	8-21	9-5	9-20	10-5	10-10	10-15	10-20	10-25	10-30	11-4	11-9	11-14
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10	7-15	7-25	8-9	8-24	9-8	9-23	10-8	10-13	10-18	10-23	10-28	11-2	11-7	11-12	11-17

***VARIATION IN SEASONAL TEMPERATURE AND DROUGHT STRESS, VARIETY, & OTHER FACTORS AFFECT MATURITY. VIRGINIA TYPE PEANUTS ARE MUCH MORE SUSCEPTIBLE THAN RUNNERS TO LOSS FROM OVER-MATURITY. Use the hull scrape guidelines to verify maturity. Vine health, weather forecast, & combining capacity also affect the digging decision.**

Quick Peanut Numbers

S. C. Production	<p>~ 105,000 tons (~ 60,000 acres) ~ \$52 million crop value @ \$ 500 per ton ~ 75-80 % virginia type, 20-25 % runners</p>
Seeding	<p>Rate: 5-6 row ft; ~ 100-125 lb/ac runners; ~ 125-145 lb/ac virginias Depth: 1.5” recommended; up to 3” if necessary to plant into moisture. Date: 5-25 May</p>
Fertility	<p>pH 5.8-6.4 Phosphorus: apply 80 lb P₂O₅/ac at soil test <11 lb/ac; 40 lb at soil test < 20 lb/ac sufficient for peanut, but maintain P levels in rotational crops. Potassium: apply 80 lb K₂O at soil test < 30 lb/ac; 40 lb K₂O at soil test < 60 lb/ac Calcium: apply 1500 lb gypsum (300 lb Ca) at first bloom Manganese: At pH 6.0 Mn soil test sufficiency is 8 lb/ac. Required soil sufficiency level increases 1 lb/ac for every 0.1 increase in pH. Apply 0.5 lb Mn (2-2.5lb manganese sulfate or Tecmangam) at 60 <u>and</u> 75 DAP or when deficiency occurs. Boron: soil sufficiency 0.5 lb; apply 0.3-0.5 lb B (1.5-2.5 lb Solubor) foliar total. Max. seasonal foliar total of 0.5 lb B. Zinc: If soil test Zn is 6-10 lb, lime to pH 6.2; at 11-20 soil test Zn, lime to pH 6.4; at 21-30 soil test Zn, lime to pH 6.5.</p>
Yield and Yield Loss (38” rows)	<p>2 tons ~ 100 pods / row ft (runner) 2 tons ~ 66 pods / row ft (virginia) runner 1 pod / row ft ~ 40 lb/ac loss virginia 1 pod / row ft ~ 60 lb/ac loss</p>
Row ft / ac	13,756 (38”); 14,520 (36”); 17,424 (30”)
Fungicide Timing	Apply leaf spot control at 30 and 45 DAP. Apply leaf spot + white mold control at 60, 75, 90, 105 DAP (see fungicide programs).
Harvest Maturity	<p>virginias: 70 % pod color (orange + brown + black); 30 % brown + black 132 -135 days for medium maturity varieties. runners: 70-75 % pod color (orange + brown + black); 40 % brown + black 140 days for medium maturity varieties.</p>
Grade	<p>TSMK (total sound mature kernels): Every 1 % increase in TSMK is worth about \$5/ton (or \$10/ac on two-ton peanuts). ELK (extra large kernels): A variety with 10% greater ELK is worth only about \$3.60 more per ton (or \$7.20/ac more on two-ton peanuts). LSK (loose shelled kernels): Each percent LSK reduces value by \$2.20 (\$4.40/ac loss on two-ton peanuts). Foreign matter: No penalty up to 4% foreign matter; -\$1 per ton at 5%; - \$6 per ton at 10% FM. Plus cleaning fee. DK (damaged kernels): Severe penalty when total damaged kernels reach 2.5%; value drops to 35% of loan or ~ \$125/ton. Fancy pods: Meaningless to grower; no reward or penalty for pod size.</p>
Bulk Density	<p>in-shell 17-24 lb/ft³ shelled 43 lb/ ft³</p>
Green Peanut Wt.	~ 35 lb / bu

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The use of trade names in this publication is intended for the purpose of clarity and information. Inclusion of a trade name does not imply approval to the exclusion of other products, which may be of similar composition. Clemson University does not guarantee or warranty the products named.

All photographs by J. W. Chapin

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